

LET'S COMPUTE!

Learn to count in French



For **ALL** users of:
Electron, BBC, Amiga,
C64/128, Archimedes,
Spectrum, Atari ST,
PC, Amstrad CPC

Start collecting
LET'S COMPUTE!
badges
See Page 4

No 5 December 1990
A Database Publication



WIN A YEAR'S SUPPLY
OF FREE GAMES!

PLUS LOTS OF OTHER
CONTEST PRIZES!

TEENAGE MUTANT HERO TURTLES™



COWABUNGA!!

THE HEROES IN A HALF SHELL™ ARE COMING!

AVAILABLE SOON ON:

Amigo, Atari ST, Commodore 64, Spectrum, Amstrad and PC.

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REGULARS

The Games Gang

Rom and Ram

Program Doctor

Safe Scientist

Final Front Ear

Build a Database

Logo Lowdown

How a Computer Works

GOTO 6

GOTO 13

GOTO 17

GOTO 22

GOTO 25

GOTO 30

GOTO 43

GOTO 50

I'm puzzled about building boats on the BBC B. First I enter:

*BUILD !BOOT

Then I type in the commands and press Escape.

But when I press Shift+Break it doesn't work. Please tell me how to do it.

— Michael Carvers (11),
Greenlaw, Scotland.

You're right so far. All you have to do now is type:

*OPT 4,3

The disc will then be ready to load using Shift+Break.

I have typed in the Witches' Brew program from the October issue. It is brilliant.

I have made an improvement to it. With a few extra lines it will also tell you how many people there are enough drinks for.

Here are the changes:

```
31 LET TV=0
221 PRINT:PRINT "Enough for
";INT(TV/1.25)+FNR(2);"people"
222 LET TV=0
330 IF C=3 THEN LET TV=TV+0.5:
PRINT "and some ";:GOTO 370
341 TV=TV+1
```

The number of people is roughly proportional to the measures.

— Alex Waddell (10), Reading, Berks.

Send for your full set of badges . . .

The badge you received free on the cover of this issue is just one of the set of four shown here.

To get the whole set send two £1 coins to Let's Compute! Badge Offer, PO Box 2, Ellesmere Port, South Wirral L65 3EB.

AND HERE'S A SPECIAL OFFER FOR LET'S COMPUTE CLUB MEMBERS

Club members can get the badges for half price. Just quote your membership number and send one £1 coin when you order.

Remember to tell us your name and address!

Notice

If you have any tips for other readers, send them in. And if you have any questions about your computer or software just ask us. We'll try to answer them on the Noticeboard.

Let us know what you want to see in future issues. And if we use your letter or ideas we'll send you a Let's Compute! baseball hat!

Send your letters to:



Let's Compute!
Europa House,
Adlington Park,
Macclesfield
SK10 4NP.

Remember to tell us your age.



I like trying the programs in Al's Gorithms.

Can you please tell me what gorithm means?

— Stuart Forsyth (9) Barnsley, Yorks

The headline Al's Gorithms is a shortened version of Alan's Algorithms. There's no such word as gorithm but an algorithm is the method used to solve a problem.

As well as being an ace cartoonist, Mike Goldberg is an expert on words. He told us that a gorithm is a gorilla with rhythm!

He even proved he was right by drawing one for us.



I've tried to type some programs from the November issue into my Spectrum. But any lines that start with FOR won't go in. For example, in the Database program I can't enter:

40 FOR X=1 TO 255

Should these lines be different for a Spectrum or am I doing anything wrong?

— Ian Holdsworth (12), Newcastle-upon-Tyne

These lines are all correct. Make sure you use the key marked FOR and the one marked TO. If you type the letters to make either word it won't work.

We'll be giving lots of hints and tips for typing in programs in the next issue of Let's Compute!

Noticeboard

Let's Compute! is terrific. Especially in the last issue when the ducks flew up in the air for Rom's food and Rom fell on the micro.

But the programs aren't suitable for my Tatung Einstein computer. Could you please publish conversions for it?

— Michael Seaton (9), Birmingham

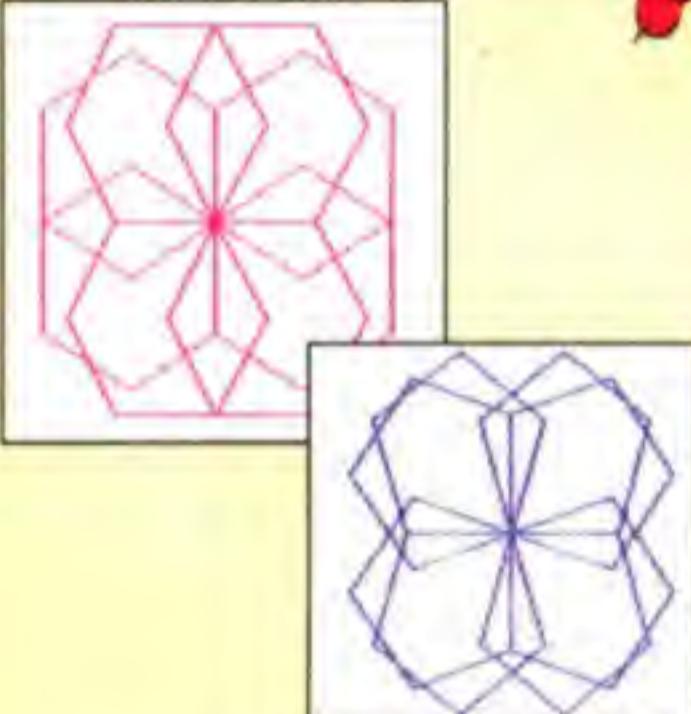
May I congratulate you on publishing such a brilliant magazine. It's educational and at the same time fun.

Is it possible to include listings for the Atari 130XE so I and many other XE owners can join in the fun?

— Hazel Gornall, Leeds

We've had lots of letters asking us to cover even more computers. We're looking at the possibility of giving programs for additional machines, but which ones should we do?

Let us know what **YOU** want to see in ***Let's Compute!*** We always try to do what you want.



I am very pleased with *Let's Compute!* I am learning a lot from it.

I have drawn lots of patterns on my Electron using Logo. They use shapes like circles and hexagons.

The routines to do them are quite easy. For circles use:

```
REPEAT 360 [ FD 5 LT 1 ]
```

For the hexagons use:

```
REPEAT 6 [ FD 300 LT 60 ]
```

— Mr Ken Weeks (70),
Blackwood, Gwent.

What a great mag. Cartoons, comics and programs. I love it.

I own a Speccy +2 and have even joined the *Let's Compute!* club.

Just one slight niggle. There are no reviews.

Could you feature one or two please? Keep up the good work

— Darren Randle (13),
Gravesend, Kent

Lot's of people have asked for reviews so we'll be printing them soon. Let us know what you want us to look at.

RESULTS

We've so many contest winners to tell you about this month that there isn't room on the noticeboard. They're on Page 53.

I have just discovered *Let's Compute!* When I saw PC on the front I got excited. I have been looking for a mag which has programs and is for the PC.

I tried out the Pop Quiz. It is very good because you can use your own questions.

I like the cartoons and my favourite is Rom and Ram. The Games Gang are great.

— Daniel Byrd (11), Bath, Avon

HIGH SCORES!

Lot's of you have sent in the coupon from last month's noticeboard. There are loads of high scores on Page 39.

If you haven't sent your scores yet — or want to send us more — there's another coupon on the page. If you don't want to cut up your copy of *Let's Compute!* just copy it onto a piece of paper.

I've tried the Shooting Star program from the November issue on my school's BBC Micro. I had no problems and it worked well.

But I couldn't get it working on my Spectrum at home. Is there anything wrong in the Is this your computer? section?

— Jason Williams (14), Glasgow

The changes listed for Line 130 for all the computers should be made to Line 220 instead.

The main program was renumbered after the alterations needed were worked out.

Unfortunately, the new numbers were not copied on to the right places.

Also, the change listed for Line 220 in the C64 version should be made to Line 240 instead. Sorry!

The Games Gang

Charlie's cheats!



Superman from the now defunct Tynesoft was a brilliant game - but oh so hard. James Hallett from Abergavenny has found a neat solution to level one anyway. When the first canon/ship appears on screen switch to heat vision and start shooting it. When it is out of energy move down, still firing. As it disappears off screen keep going down and firing.

MORE YOU MUST NOT MISS

Top on US Gold's list are two really action-packed coin-op conversions. **UN Squadron** is a shoot-'em-up set right in the centre of the Middle East. And **Strider 2** features the original muscle-bound hero sporting the handy ability to transform himself into a robot.

Activision also have two major arcade conversions up their sleeves. **Atomic Robokid** is a cutesy shoot-'em-up, complete with secret rooms and metallic monsters.

If you want the chance to sample the ultimate experience of riding a lethal dragon straight into the enemy's den take a look at **Dragon Breed**.

You can get all these titles on all popular formats except PC, Archimedes and BBC.

Meanwhile from Mindscape there's **Days Of Thunder**. It's a



Robocop 2 from Ocean a top seller this Christmas?

Licensed to sell

Lots of software has the name of a film, a famous person or something else that's a real crowd puller. The software houses have to pay the person who owns the name before they use it. It's called a licence.

Every December sees the big software companies getting ready to pull out their mega-selling licensed games for Christmas. And this year is no exception!

There are three hot hits from Ocean. **Robocop 2** is the sequel - you've guessed it - to Robocop. And watch out for **Special Criminal Investigation**. It's the follow-up to the driving extravaganza **Chase HQ**.

There's also the conversion of Arnie Schwarzenegger's big summer film, **Total Recall**.

racing game based on Tom Cruise's exploits in the film of the same name.

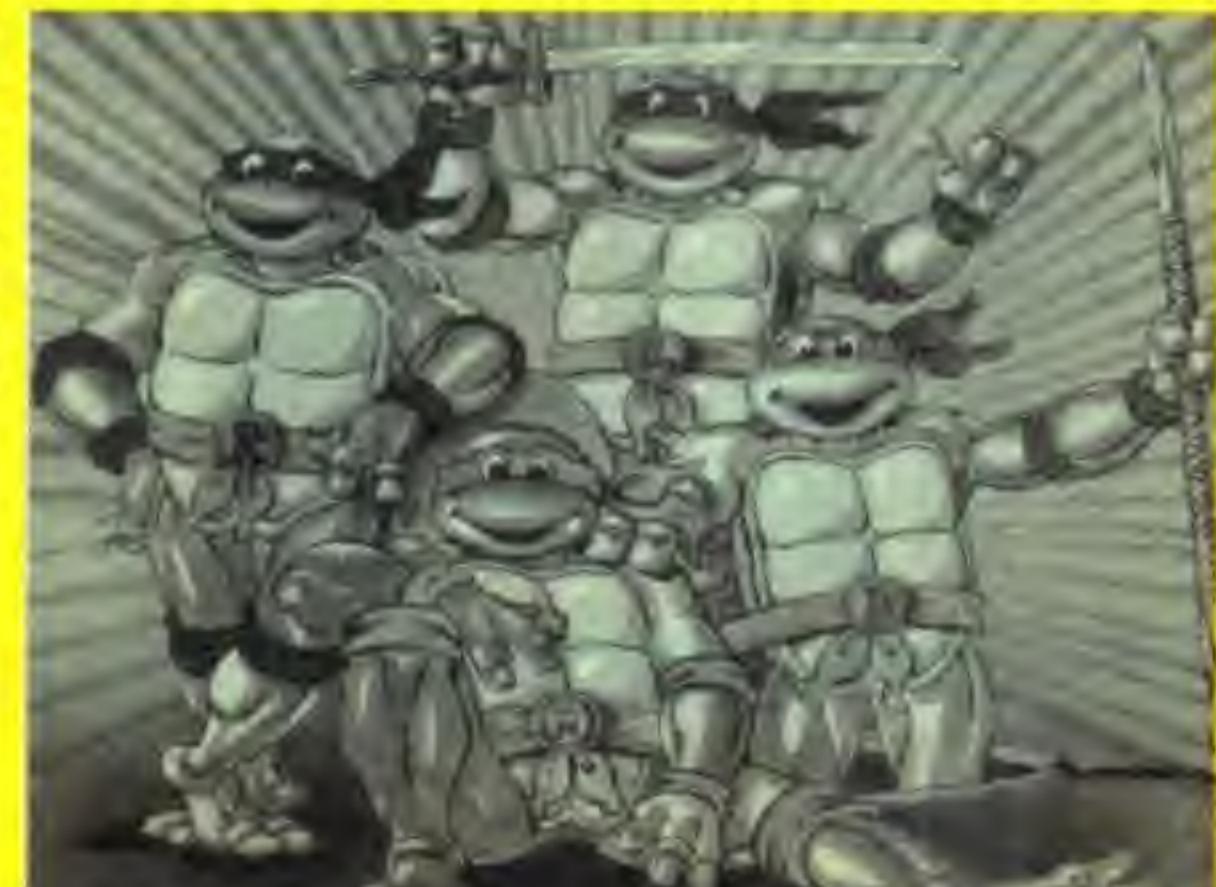
It should be on the shelves now on all formats except Amstrad, Archimedes and BBC.

Another film heart-throb waiting to make his way into your computer is Roger Moore. He's in Domark's **The Spy Who Loved Me**. It's for all computers except BBC and Archimedes and it's the best Bond game so far.

And there's one Yuletide release everybody is waiting for. In the October issue of *Let's Compute!* we told you that Imageworks' **Teenage Mutant Ninja Turtles** was on the way. It's now out and it's got to be the Christmas biggy.

You can get it on all formats except Archimedes, BBC and PC. But a PC version is available directly from the US.

Turtle power... they're green and they're mean and they're out NOW!



Alternative Xmas...

If you fancy something a bit different from the usual licence crop there are plenty of offerings to get your gnashers into.

There are far too many to mention them all here, but let's look at some of the best.

Keep a special lookout for two Lucasfilm titles. The quirky puzzler **Night Shift** comes on all formats except BBC and Archimedes. The hilarious adventure **Secret Of Monkey Island** is for the PC only.

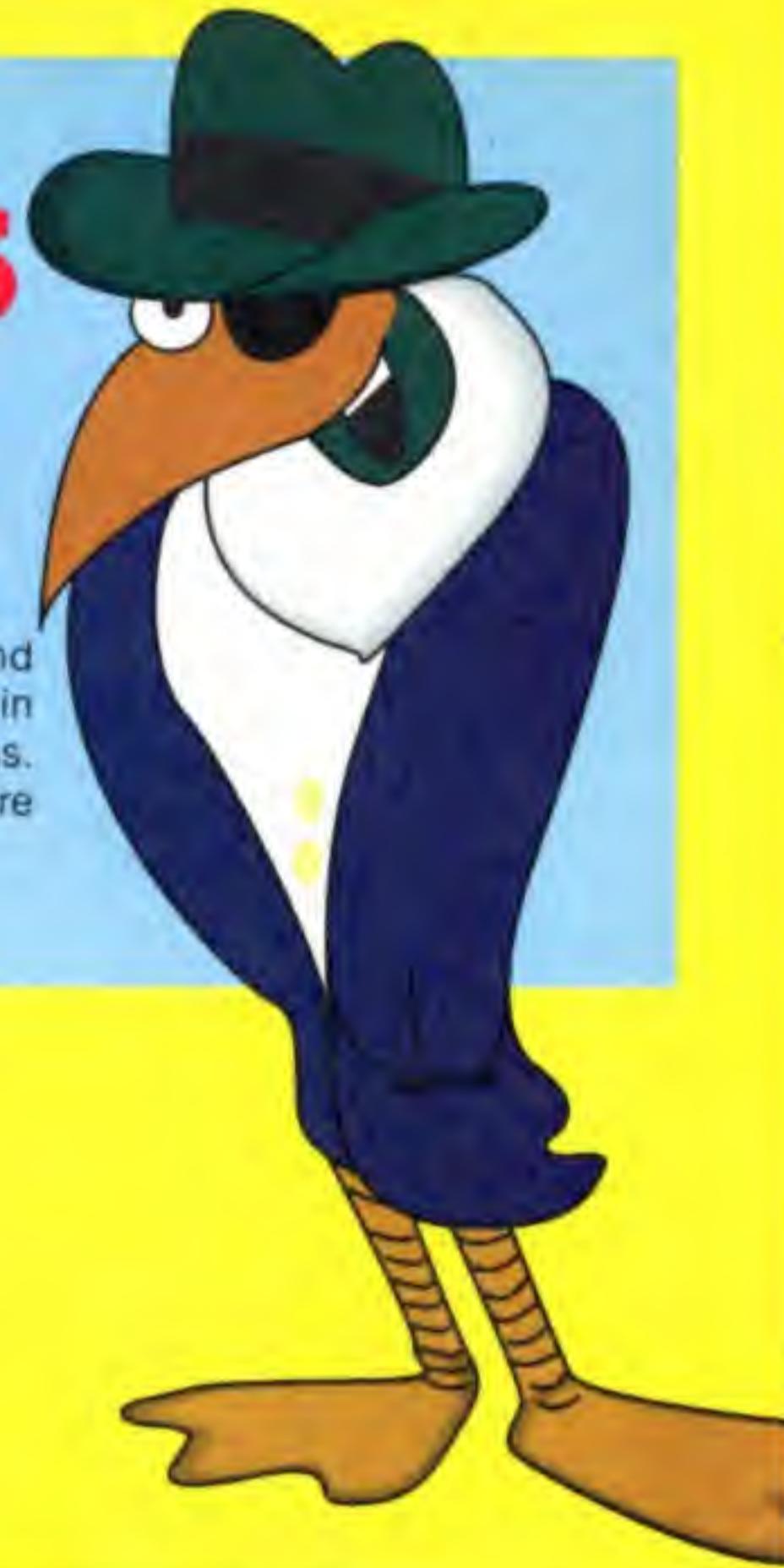
Among the pick of the rest is Electronic Art's **Powermonger**. It's the staggeringly impressive sequel to Populous.

There's also Rainbird's medieval strategy game **Betrayal** and Millenium's **James Pond**. It's a cutesy underwater action romp for the Amiga and Atari ST.

Peter's Patch!

Anyone who has played **Sabre Wulf** and has a Computer Concepts Spellmaster in their BBC will have been having problems. The solution is to type in the following before you start to play:

`!&210=(!(!FFB7+810)`



WATCH OUT, ACORN OWNERS!

Most of the major multi-format software houses seem to forget the humble Electron, BBC and Archimedes. But don't despair. There are still plenty of games for you around.

If you have a Master 128 or Archimedes with PC emulator you'll find that most games for the PC will work on your computer. Check the screen modes before you buy and make sure your machine can cope with them.

But to get the most from your micro stick with the software houses who write for those machines. Here are some look out for this Christmas:

Title	Company	Computer	What the game is	Comment
SimCity	Superior Software	BBC/Electron	Run a city, coping with natural disasters and economic disaster	Brilliant.
The Wimp Game	4th Dimension	Archimedes	Pointer-driven graphic adventure you can run while in other programs	Mousemania
TwinWorld	Cygnus	Archimedes	A superbly wicked arcade adventure	Eat your heart out ST and Amiga owners

Pam's Passwords

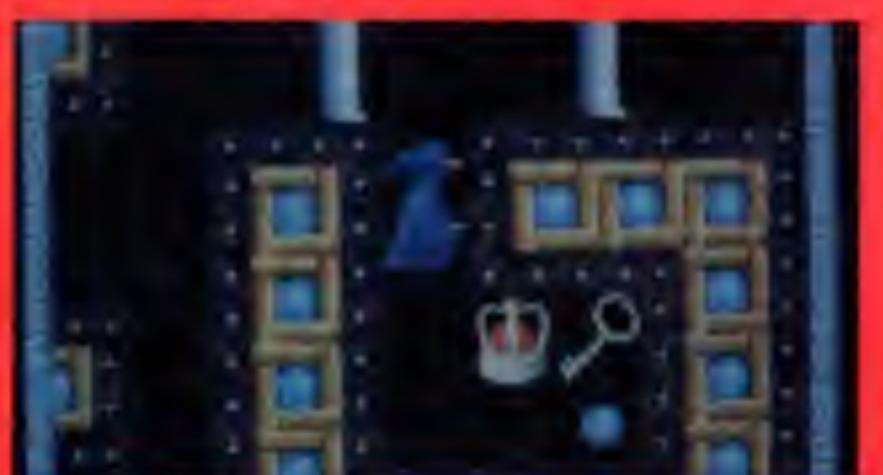


Struggling with Gremlin's **Venus: The Flytrap**? Well here's a list of the passwords to make life easier.

Level	Password
2	MANTIDS
3	CICADAS
4	PSYLLIDS
5	PIERIDS
6	SATYRID
7	LYCAENID
8	PYRALID
9	NOCTUI
10	no password

David Ward from Rushden has been working/playing very hard with **Thundermonk**. He has sent in the following:

Level	Password
1	no password
2	SPOOK
3	SHIVER
4	HALLOWEEN



IT'S THE SIMPSONS

Have you heard of the Simpsons? If you haven't yet you soon will. In America this grouchy cartoon family are even bigger than the Teenage Mutant Hero Turtles.

They're now starting to become trendy over here. Ocean have picked up the computer games licence so you should be able to sample Simpson humour first hand some time next summer.



If you've any hints, pokes or cheats you'd like us to print send them to at:
Let's Compute! Europa House, Adlington Park, Macclesfield SK10 4NP.

Cat and Mouse



Sometimes the

SO WHEN ITS LIFE OR DEATH

Situation Allows

CONFFLICT ON YOUR COMPUTER GAME

No Second

YOU CAN RELY ON CONTRIVER!

Chances . . .

BREEDER OF SMART MICE!

By



CONTRIVER
europe ltd

Henrietta's Tree of Presents!

HOORAY!

£1,000 worth of software **MUST** be won!

Hopeless Henry and Henrietta are the two heroes in Scetlander's games - Hooray for Henrietta and Henrietta's Book of Spells. Now **YOU** can meet them.

We've 25 copies of both to give away. This is your chance to win a copy of each!

They're available for the IBM PC, Atari ST, Commodore Amiga and Spectrum.

Hooray for Henrietta has both Henry and Henrietta in a jam. John the parrot has kidnapped Henry, his coat, hat, boots and trousers.

All this is very upsetting for Henrietta as they are to be married in the morning. To rescue Henry she must solve some puzzles. Fail and Henry is covered in cold custard!

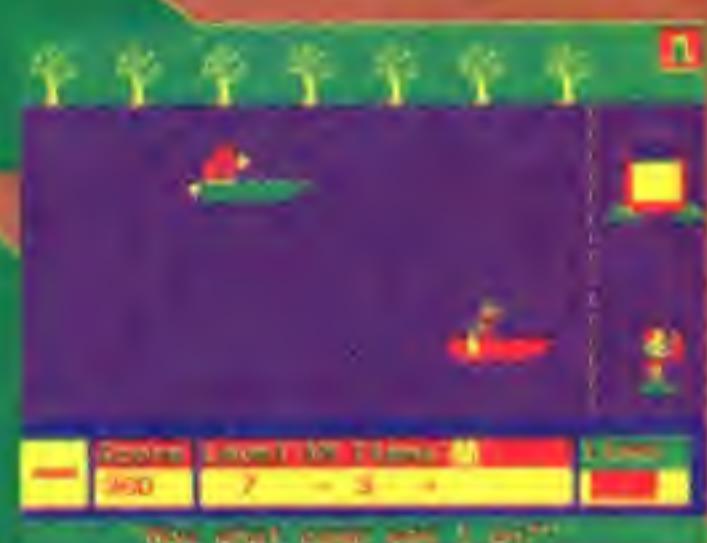
Henrietta's Book of Spells is where you will meet Cedric the Skeleton and the wicked Morgana the Morbid.

Henry is in trouble again. He bumped into Castle Spellalot so Morgana turned him into a frog. It's up to you to help Henrietta rescue him.

There are 25 sets of the two games to win. All you have to do is to find the names of some people in the wordsquare on the entry form.

Here are the names: Cedric, Henry, John and Morgana. Just draw a circle round them.

Hurry! Only the first 25 correct entries will receive a prize. So make sure you fill in the entry form and send it to Let's Compute! before December 31 1990.



Entry form

C	E	D	R	I	C	J
E	R	T	N	S	W	Q
M	B	H	P	O	I	U
L	O	E	X	D	V	G
J	M	N	E	R	T	C
M	O	R	G	A		
S	A	Y	B	E	S	T

Please tick your choice:

- PC 3.5in disc
- PC 5.25in disc
- Spectrum tape
- Spectrum disc
- Atari ST
- Amiga

Name

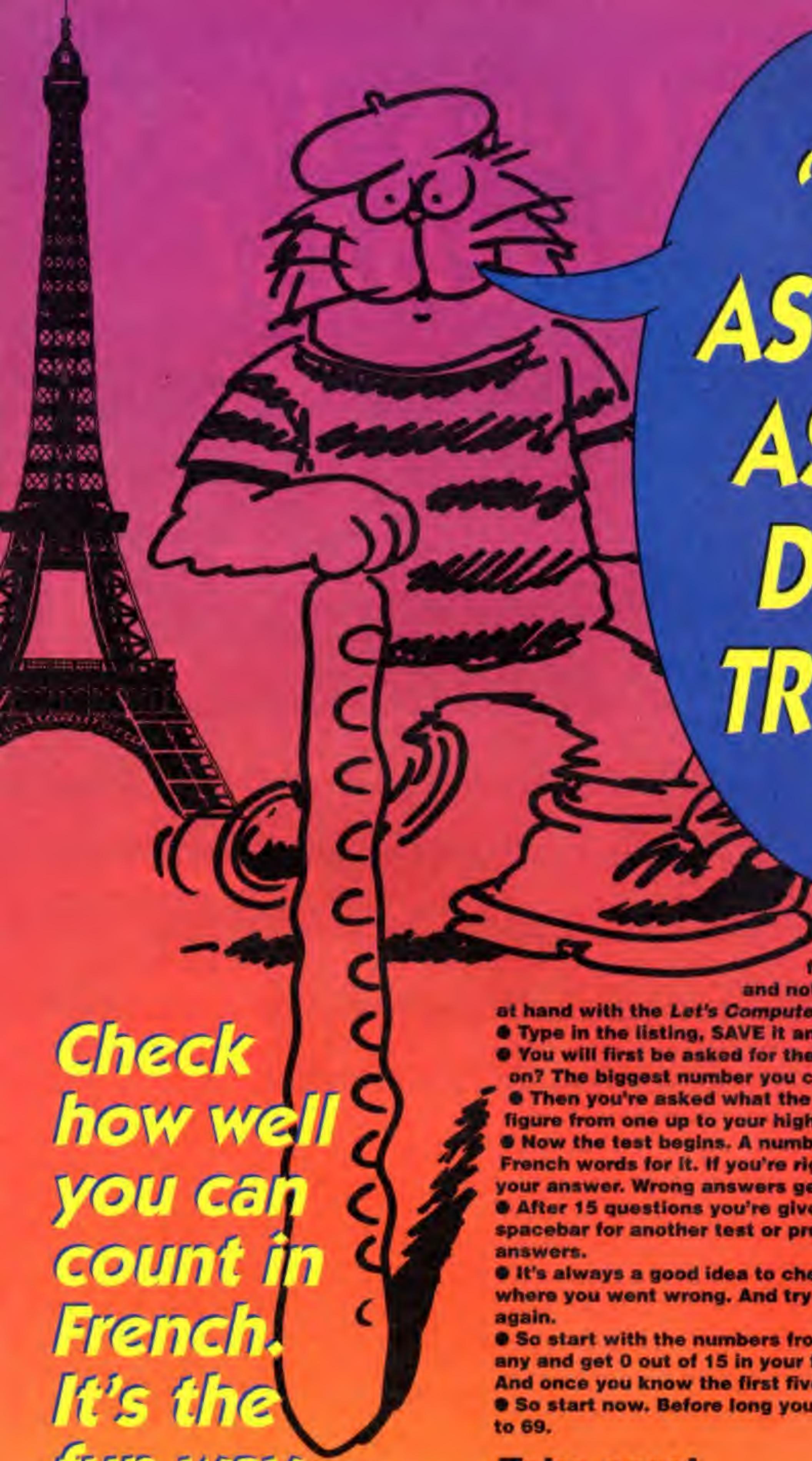
Address

.....

Postcode

Age

Send to Henrietta Contest, Let's Compute! Europa House, Adlington Park, Macclesfield SK10 4NP.



**Check
how well
you can
count in
French.
It's the
fun way
to learn**

**"IT'S
AS EASY
AS UN,
DEUX,
TROIS!"**

Have you ever stared at lists of foreign words you need to learn - and not know where to start? Help is now

at hand with the *Let's Compute!* French number test.

- Type in the listing, **SAVE** it and **RUN** it.
- You will first be asked for the highest number you want testing on? The biggest number you can answer is 69.
- Then you're asked what the lowest number is. This can be any figure from one up to your highest.
- Now the test begins. A number will be shown. Just type in the French words for it. If you're right a tick will be shown next to your answer. Wrong answers get a cross.
- After 15 questions you're given your score. You can press the spacebar for another test or press C to look at the correct answers.
- It's always a good idea to check your answers. You can see where you went wrong. And try not to make the same mistake again.
- So start with the numbers from 1 to 5. Even if you don't know any and get 0 out of 15 in your first test, you'll soon learn them. And once you know the first five, try a few more.
- So start now. Before long you'll know all the French numbers up to 69.

Take care!

Make sure you enter the **DATA** lines exactly as they are printed. If you make a mistake you could be learning the wrong spelling of a French word.

Note that, as we've used lower case letters you should answer in lower case. If, instead, you enter the listing in capitals, answer in capitals.

Un

What is the highest number you want? 75
69 is the biggest

What is the highest number you want? 65

What is the lowest number you want? 56
Don't be silly!

What is the highest number you want? 45

What is the lowest number you want? 20

quarante-deux /
vingt-cinq /
trente-trois /
trente-huit /
quarante-quatre /
quarante-et-un x
trente-neuf /
quarante-trois x
trente-trois /
vingt-quatre /
quarante-cinq x
vingt /
quarante-cinq x

deux

What is French for 34?

Choosing the size of your test

Trois

quarante-cinq x
vingt-trois /
trente-sept /
vingt-neuf /
vingt-huit x
quarante-quatre /
trente-trois /
quarante-quatre /
trente-et-un x
trente-trois /
vingt-cinq /
quarante-quatre /
vingt /
trente-sept /
vingt-et-un /

You got 12 out of 15.

Checking your score

```

10 REM FRENCH NUMBERS
20 REM (c) Let's Compute!
30 DIM N(100):DIM WS(100)
40 PRINT:LET X=RND(-TIME)
50 LET S=0:LET SS=" "
60 FOR I=1 TO 19:LET SS=SS+"":NEXT I
70 FOR I=1 TO 19:READ WS(I):NEXT I
80 FOR I=20 TO 60 STEP 10
90 READ AS:LET WS(I)=AS
100 LET WS(I+1)=AS+" et un"
110 FOR J=2 TO 9
120 LET WS(I+J)=AS+"-"+WS(J)
130 NEXT J:NEXT I
140 CLS
150 PRINT:INPUT "What is the highest number you want?";H
160 IF H>69 THEN PRINT "69 is the biggest":GOTO 150
170 PRINT:INPUT "What is the lowest number you want?";L
180 IF L=0 OR L>H THEN PRINT "Don't be silly!":GOTO 150
190 CLS
200 FOR I=1 TO 15
210 LET N(I)=RND(H-L+1)+L-1

```

```

220 NEXT I
230 FOR Q=1 TO 15
240 LET QU=N(Q)
250 LET X=0:LET Y=19:LET TS="What is French for "+STR$(QU):GOSUB 430
260 INPUT RS
270 LET X=0:LET Y=19:LET TS=SS+SS:GOSUB 430
280 IF RS=WS(QU) THEN LET S=S+1:LET MS="/"
290 IF RS<>WS(QU) THEN LET MS="x"
300 LET X=20:LET Y=Q+2:LET TS=RS:GOSUB 430
310 LET X=39:LET Y=Q+2:LET TS=MS:GOSUB 430
320 NEXT Q
330 LET X=0:LET Y=19:LET TS="You got "+STR$(S)+" out of 15.":GOSUB 430
340 LET X=0:LET Y=8:LET TS="Press Space for":GOSUB 430
350 PRINT:PRINT "another go."
360 PRINT "Press C for"
370 PRINT "correct answers."
380 GOSUB 510
390 IF AS="C" OR AS="c" THEN GOSUB 450

```

```

400 IF AS<>" " THEN GOTO 380
410 RUN
420 REM ** PRINT SUBROUTINE **
430 PRINTTAB(X,Y)TS;
440 RETURN
450 REM ** PRINT CORRECT ANSWERS **
460 LET X=0:LET Y=8:LET TS=SS:GOSUB 430
470 PRINT:PRINT SS:PRINT SS:PRINT SS:L
ET X=0:LET Y=3:LET TS="":GOSUB 430
480 FOR Q=1 TO 15:PRINT STR$(N(Q)):" "
;WS(N(Q)):NEXT Q
490 PRINT:PRINT "Press Space for another go.":GOSUB 510
500 RETURN
510 LET AS=GET$:
520 RETURN
530 DATA "un","deux","trois","quatre",
"cinqu","six","sept","huit","neuf","dix"
540 DATA "onze","douze","treize","quatreze",
"quinze","seize","dix-sept"
550 DATA "dix-huit","dix-neuf","vingt",
"trente","quarante","cinquante"
560 DATA "soixante"

```

IS THIS YOUR COMPUTER?

Electron/BBC/Archimedes

The program works as shown

Commodore 64/128

Enter the program in capitals
Change these lines:

```

140 PRINT CHR$(147);
150 PRINT CHR$(147);
210 LET N(I)=INT(RND(8)*(H-L+1)+L)
310 LET X=38:LET Y=Q+2:LET TS=RS:GOSUB
430 POKE 211,X:POKE 214,Y:SYS 58732:PR
INT TS;
510 GET AS:IF AS="" THEN 510

```

Spectrum

Select 48k mode. Change these lines:

```

30 DIM N(100):DIM WS(100,16):DIM RS(16)
40 PRINT : RANDOMIZE
50 FOR I=1 TO 15:LET SS=SS+"":NEXT I
210 LET N(I)=INT(RND*(H-L+1)+L)
310 LET X=14:LET Y=Q+2:LET TS=RS:GOSUB
430
310 LET X=31:LET Y=Q+2:LET TS=MS:GOSUB
430
430 PRINT AT Y,X;TS;
510 LET AS=INKEY$:IF AS="" THEN GOTO 5
10

```

PC (GW-Basic)/Amstrad CPC

Change these lines:

```

40 PRINT:RANDOMIZE TIMER
210 LET N(I)=INT(RND*(H-L+1)+L)
430 LOCATE Y+1,X+1:PRINT TS;
510 LET AS=INKEY$:WHILE AS="" :L
ET AS=INKEY$:WEND

```

CPC: Use TIME instead of TIMER in Line 40
Use X+1,Y+1 instead of Y+1,X+1 in Line 430

Amiga and Atari ST

Use Amos or Stos. Change these lines:

```

40 PRINT:LET X=RND(TIMER)
210 LET N(I)=RND(H-L)+L
430 LOCATE X,Y : PRINT TS;
510 AS=INPUT$(1)

```



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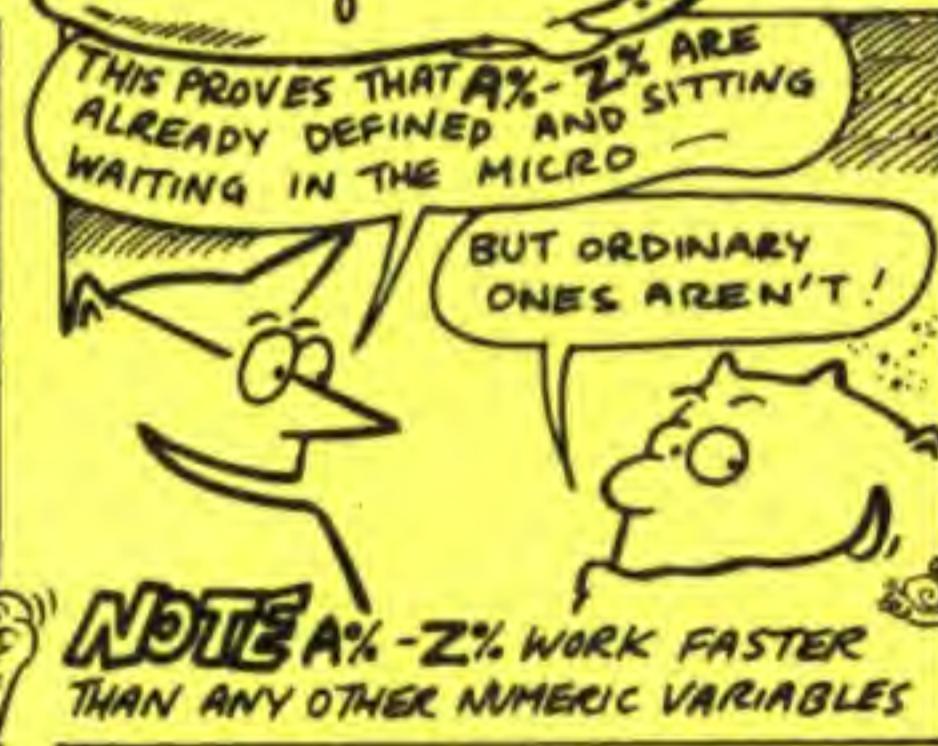
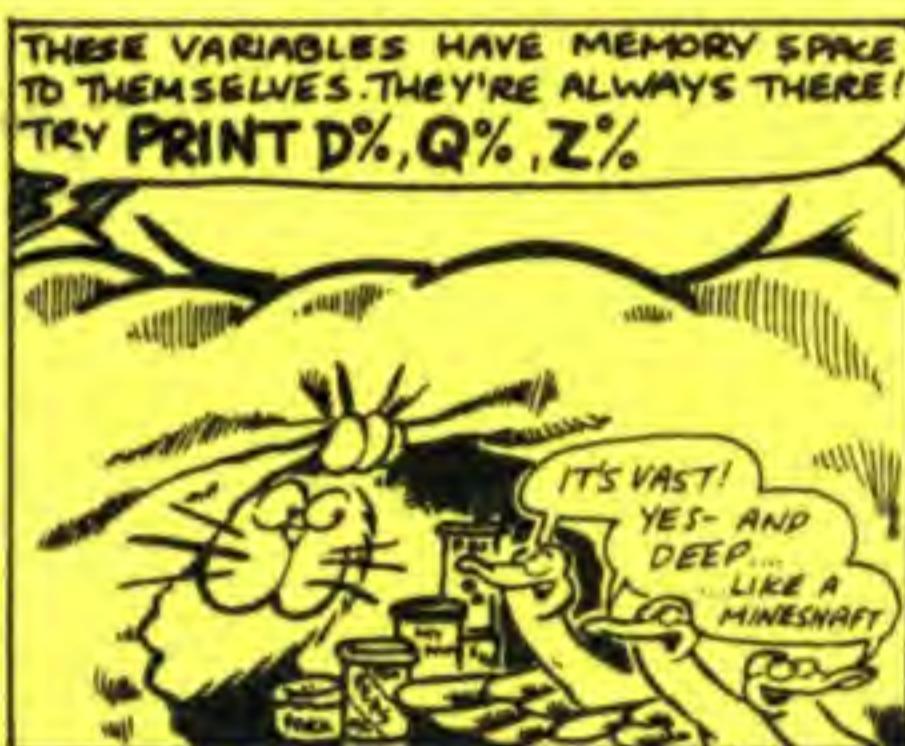
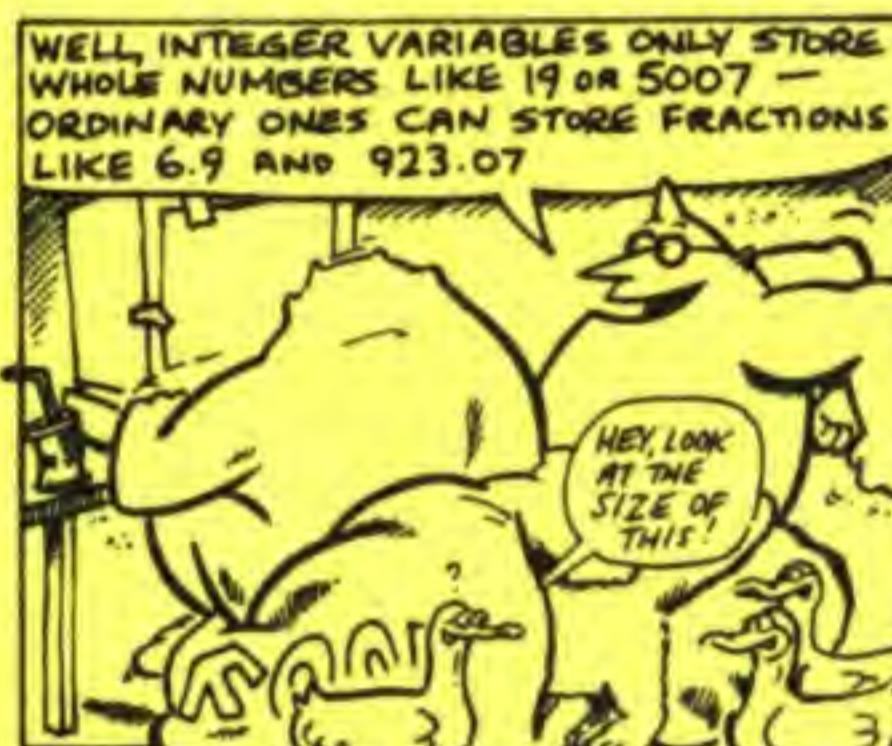
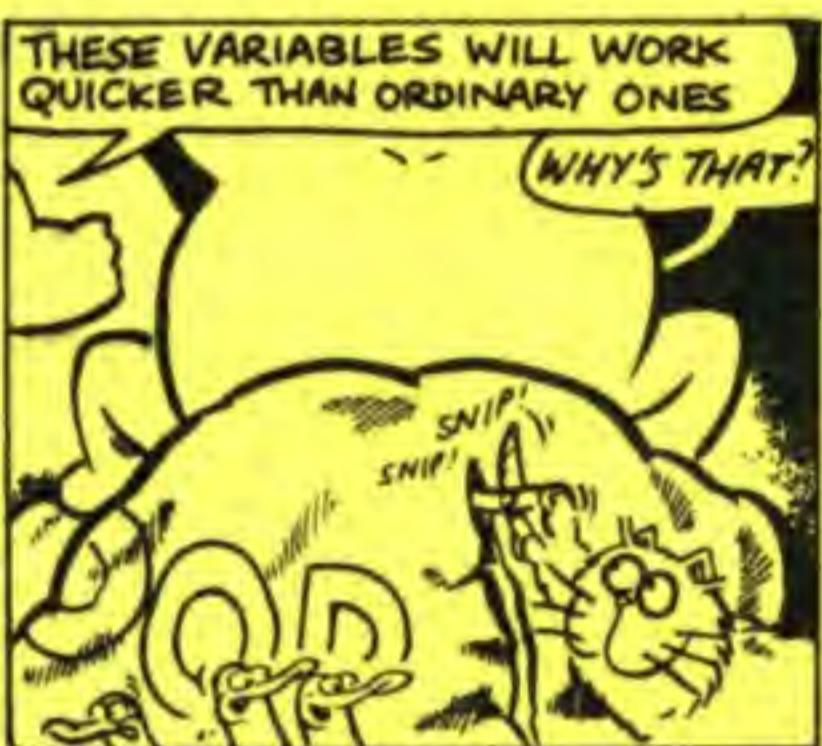
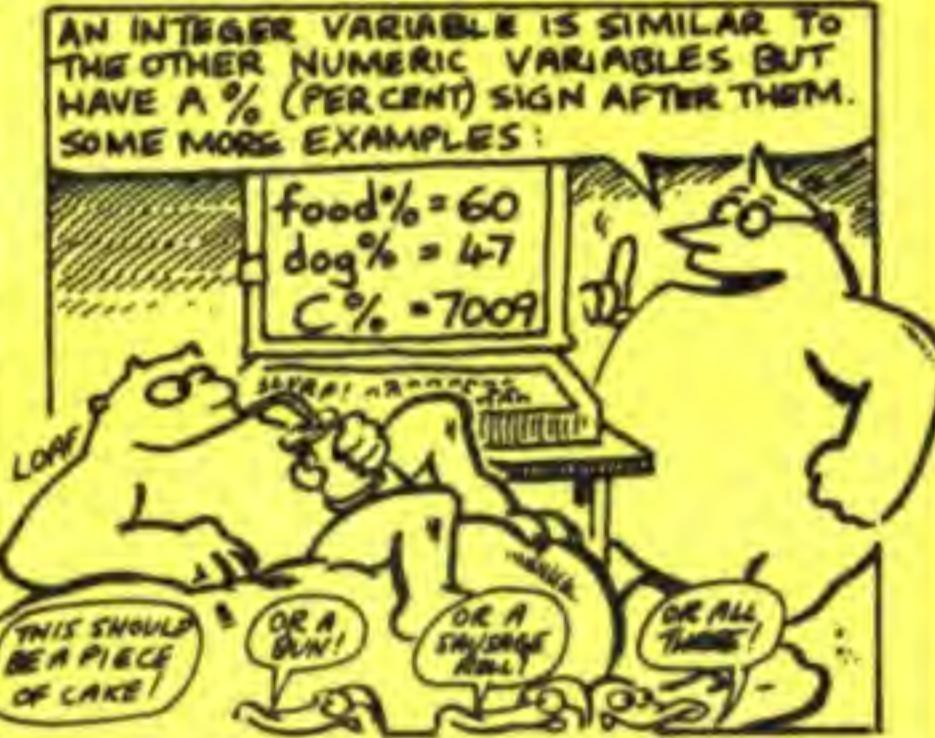
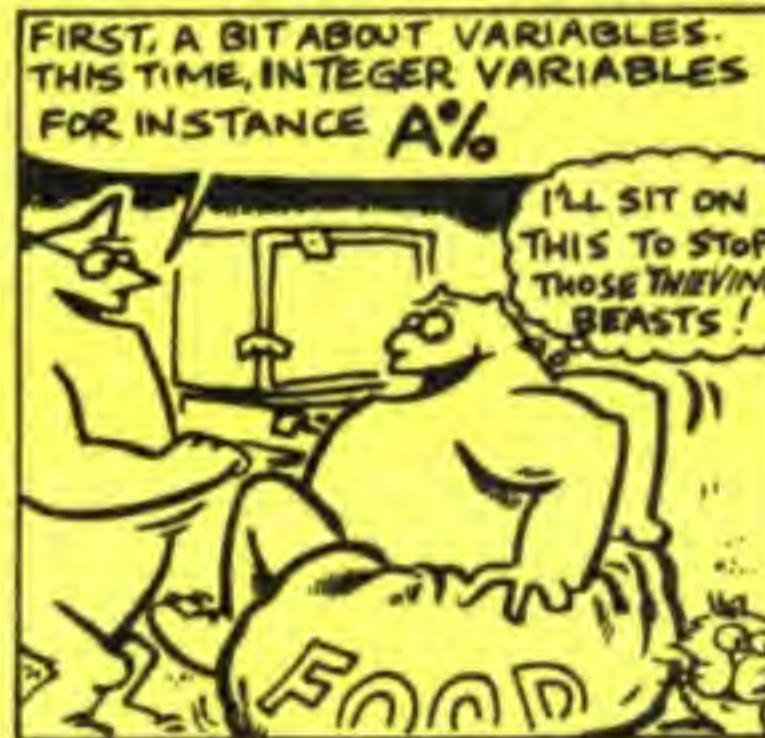
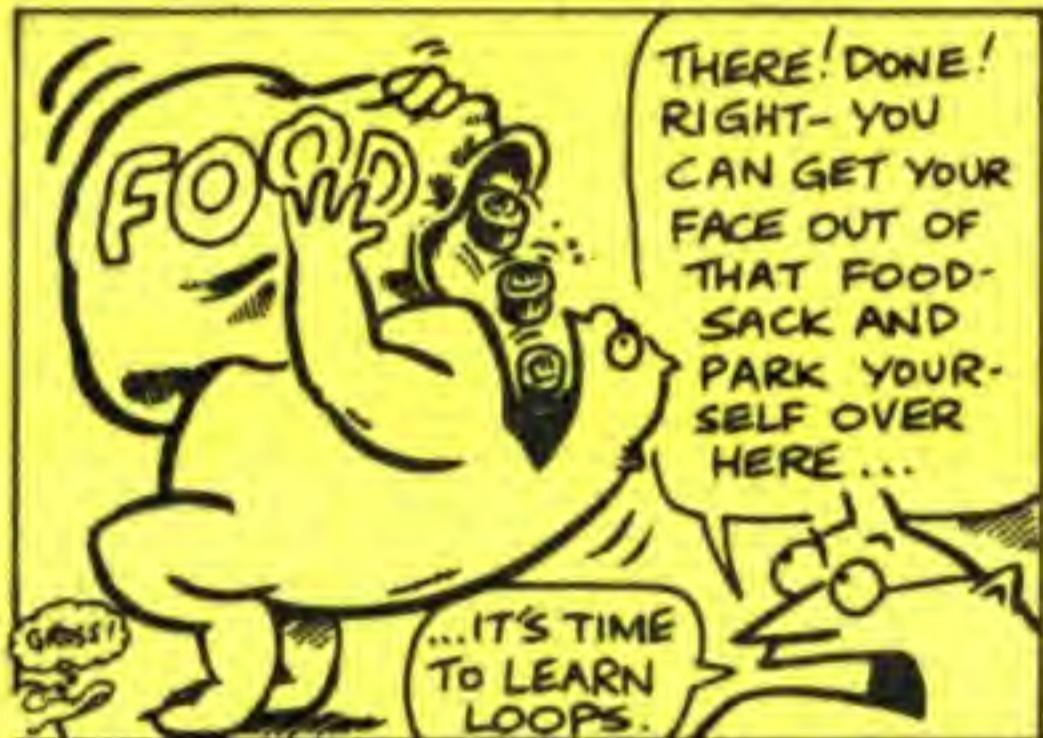
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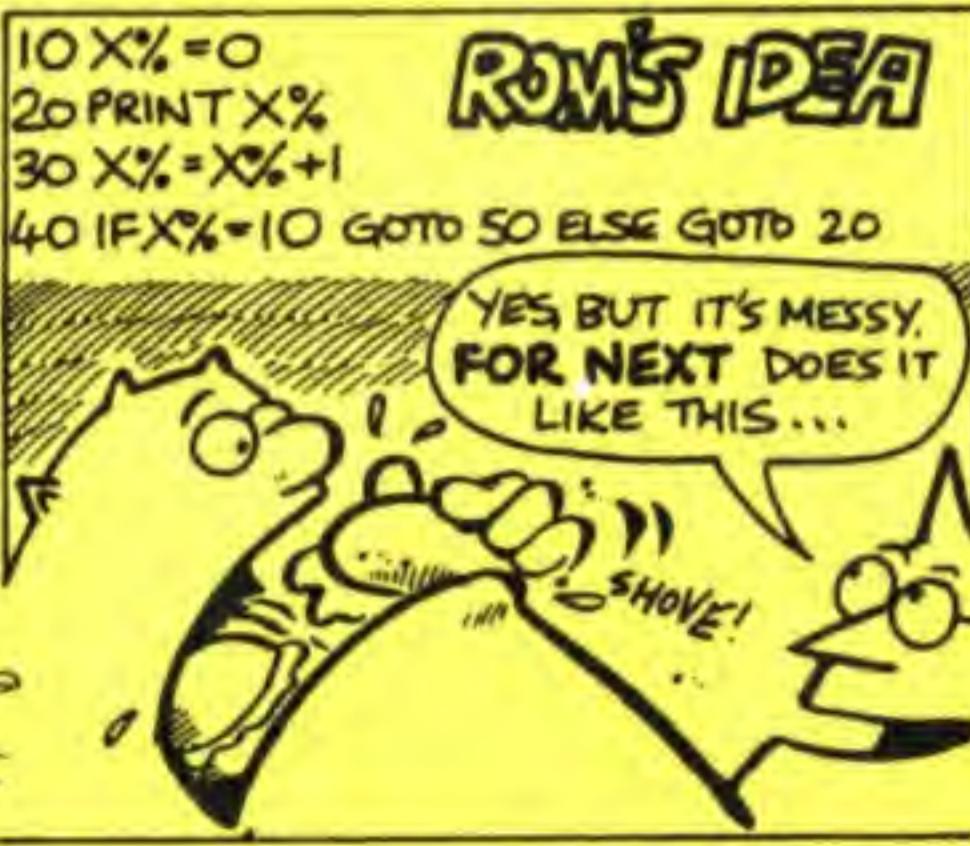
BBC BASIC

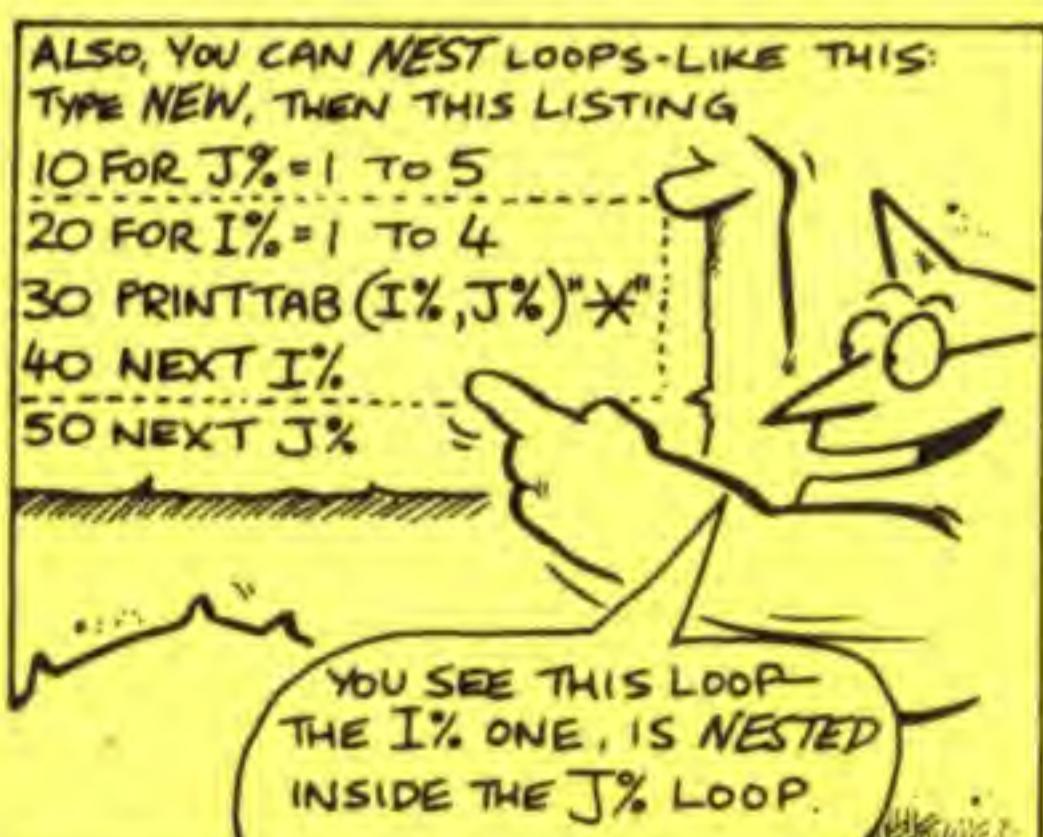
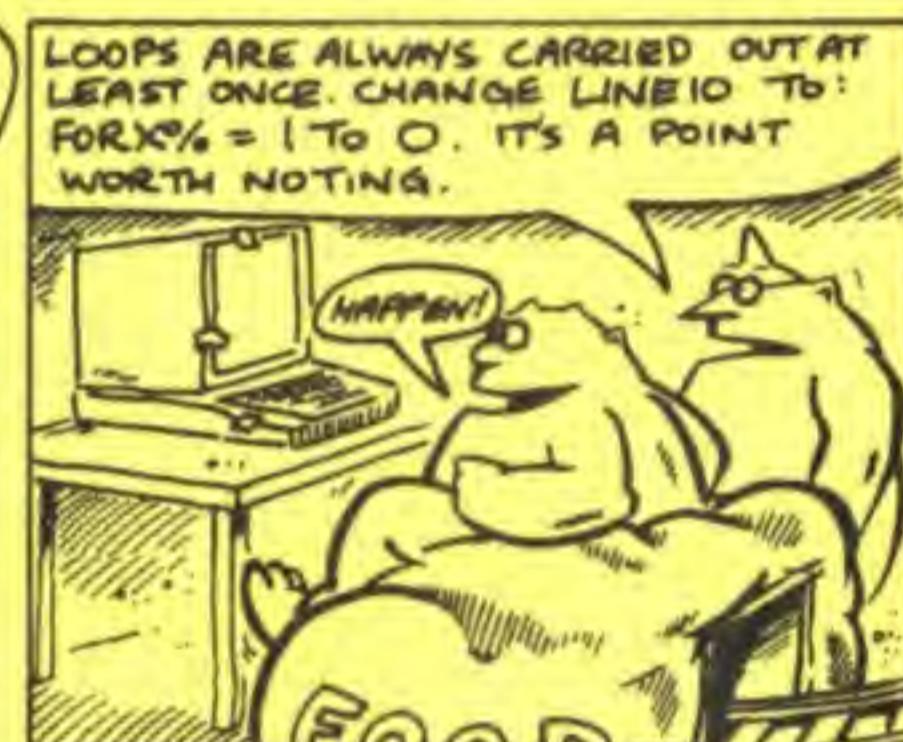
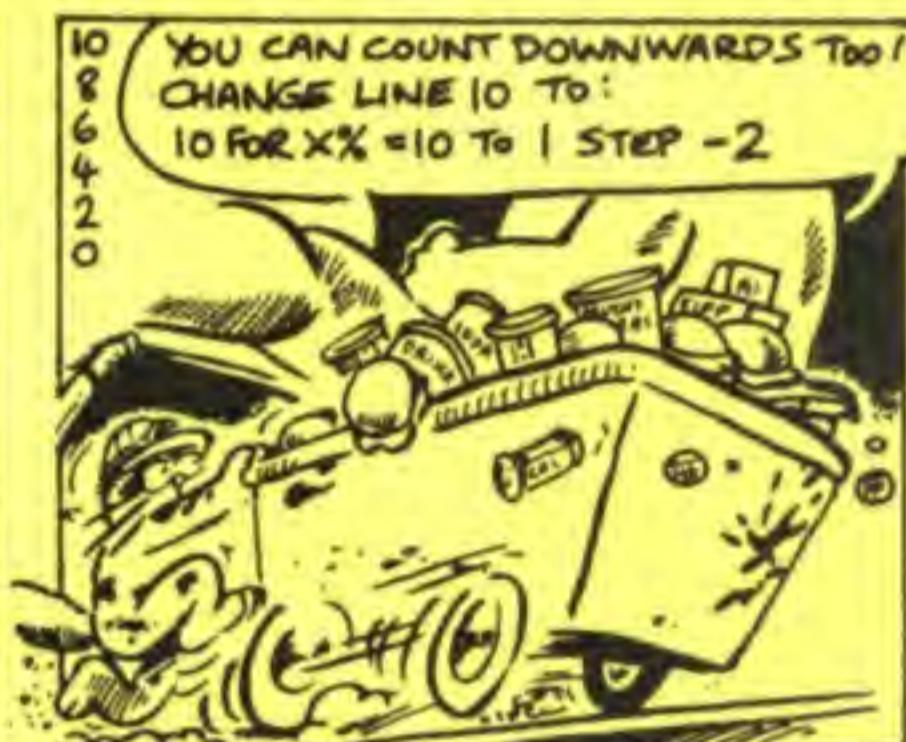
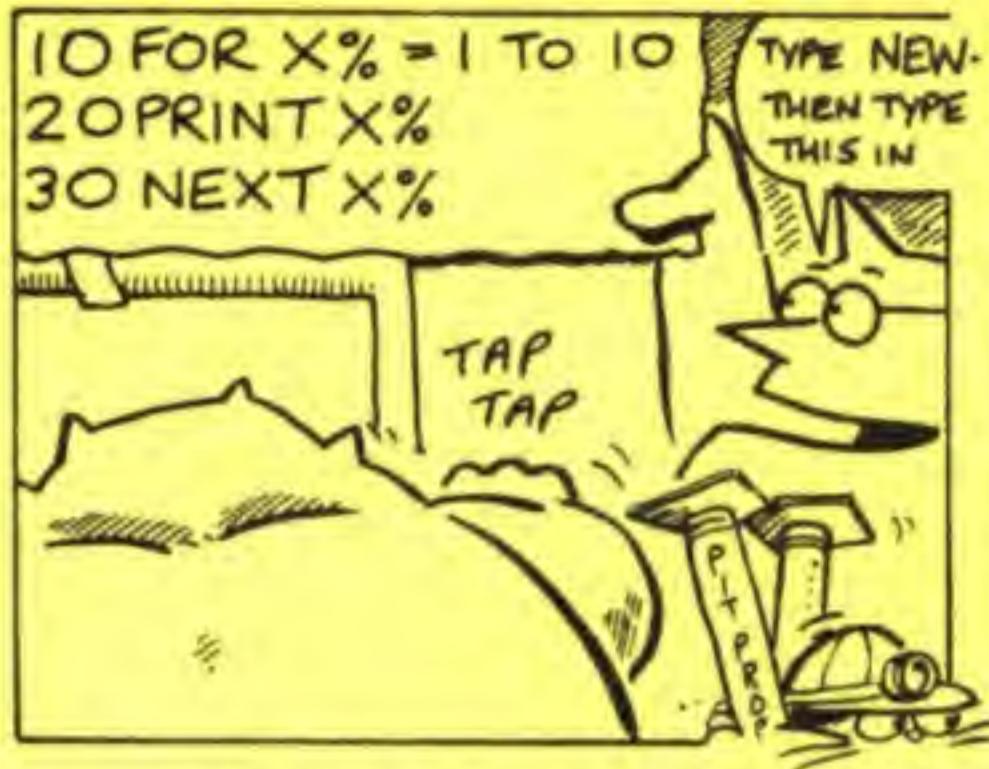
WITH

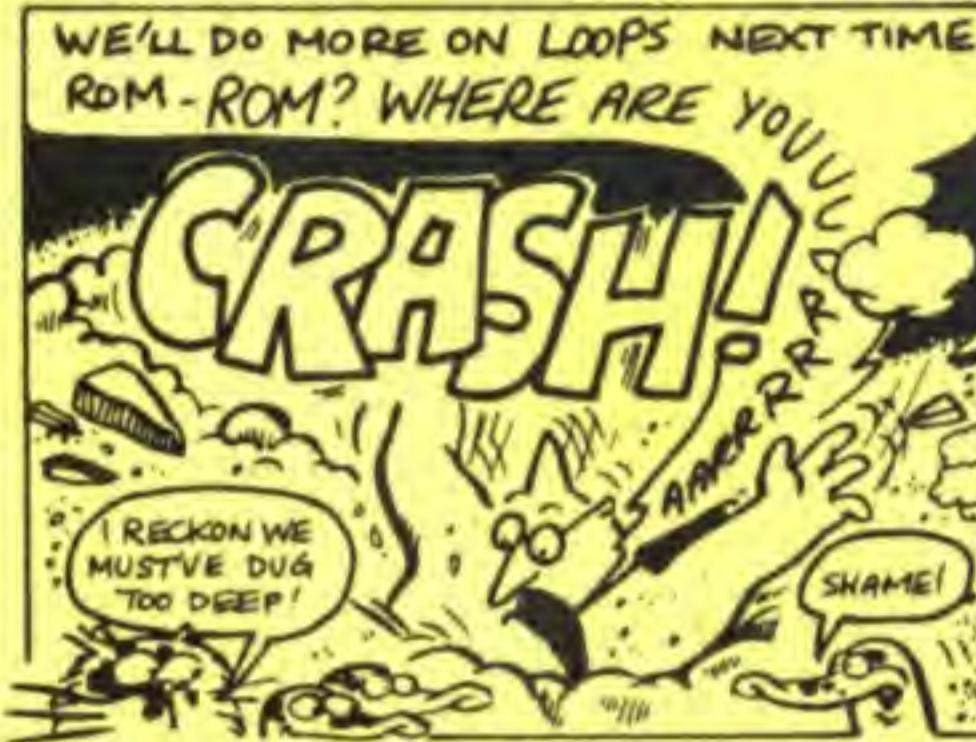


WE'LL USE INTEGER VARIABLES WITH
OUR NEW COMMANDS FOR LOOPS
SO, NOW FOR A **FOR NEXT** LOOP

TO REPEAT A STATEMENT A CERTAIN AMOUNT OF TIMES, A FOR NEXT LOOP IS BEST.









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Five levels of alien warfare lie before you – the most devilishly ingenious terra incognita you have ever faced awaits you, determined to question your genius and cause your downfall – can you keep ahead of this masterpiece of technical wizardry – conquer hitherto uncharted, undreamed of heights?

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THE PROGRAM DOCTOR

It's never a good idea to jump out of loops. But lots of people do! Our tame micro medic tells of other ways.



This is the original program:

```
10 CLS
20 PRINT "TYPE THE ALPHABET NOW!"
30 FOR I = 1 TO 26
40 GOSUB 160
50 PRINT X$;
60 IF X$<>CHR$(I+64) THEN GOTO 100
70 NEXT I
80 PRINT:PRINT:PRINT "WELL DONE"
90 GOTO 110
100 PRINT:PRINT:PRINT "YOU GOT IT
WRONG"
110 PRINT:PRINT "DO YOU WANT ANOTHER GO?"
120 GOSUB 160
130 IF X$="Y" THEN GOTO 10
140 PRINT:PRINT "BYE"
150 END:REM ON SPECTRUM USE STOP
160 INPUT X$
170 RETURN
```

Here are Doc's changes:

```
25 LET F=0
60 IF X$<>CHR$(I+64) THEN LET F=1
:LET I=26
75 IF F=1 THEN GOTO 100
```

This program works on all home micros

Here's another program that fell on to Doc's operating table. It's a simple game that tests how well you know the alphabet.

Type it in and try it. It appears to work OK. But it has several faults.

For example, after asking if you want *Another Go?* it only checks whether you press Y. But what if a different key is pressed? Doc showed the answer to that one in our October issue.

What worries Doc most is the jump out of the loop. The loop is from Line 30 to Line 70. If you press a wrong key the program jumps to Line 100.

This works when you first run the program. But on most computers you'll soon get an error message if you keep typing the wrong letter.

On the BBC Micro, after you've made about 20 mistakes, you'll get this message:

Too many FORs at line 30.

But whether you get an error message or not, it's still bad programming! So how do you cure it? There are lots of ways.

Doc has found four.

The changes you need to make depend on the Basic language that is in your computer. Two of Doc's cures will work on all computers but the others will only work on ones that understand the new commands he uses.

Doc's first remedy is to change the GOTO 100 in Line 60 to LET I=26. This means that when the loop reaches the NEXT I it has reached the highest value of I and it leaves the loop without the jump.

But now the program doesn't know whether to print a won or lost message. To get round this Doc uses what is known by programmers as a flag.

In Line 25 he sets his flag to 0. Then, in Line 60, it is changed to 1 if a mistake is made as a letter is typed. So at Line 75, if the flag has been changed from 0 to 1, the program knows it has to jump to line 100. The other three methods also use the flag.

Next month Doc will look at three other ways to solve this problem. They are REPEAT...UNTIL, WHILE...WEND and Doc's own repeat.

But in the meantime, the main point to remember is that you should NEVER jump out of a loop.

Do you think YOU have written a program that can't be improved? Then send it along to the Program Doctor. He loves a challenge!

Electron/BBC Micro/Archimedes core

```

10 REM AL'S GORITHMS ... ELLIPSES
20 REM (c) LET'S COMPUTE!
30 MODE 1
40 GCOL0,129
50 CLS
60 PRINT:PRINT "JUST A MO, CALCULATIN
G...."
70 REM LOOK-UP TABLE
80 DIM T(72,2)
90 FOR I=0 TO 72
100 LET T(I,1)=COS (RAD (I*5))
110 LET T(I,2)=SIN (RAD (I*5))
120 PRINT TAB(5,5) I
130 NEXT I
140 CLG
150 FOR P=0 TO 27
160 READ M1,M2,IC,XC,YC,CL
170 GOSUB 200: REM DRAW ELLIPSE
180 NEXT P
190 GOTO 190
200 REM ELLIPSE ROUTINE
220 GCOL 0,CL
230 MOVE XC,YC
240 DRAW XC+M1*T(IC/5,1),YC+M1*T(IC/5,

```

```

2) 250 FOR A=0 TO 360 STEP 15
260 MOVE XC,YC
270 LET X=M1*T(A/5,1)
280 LET Y=M2*T(A/5,2)
290 LET XT=X*T(IC/5,1)-Y*T(IC/5,2)+XC
300 LET YT=X*T(IC/5,2)+Y*T(IC/5,1)+YC
310 PLOT 85,XT,YT
320 NEXT A
330 RETURN

```

PROGRAMMING NOTE!

This program uses SIN and COS in a lot of calculations.

To save your computer working them out each time an ellipse is drawn, they are all calculated at once in Lines 70 to 130.

The results are saved in all the

memory locations called T. Then the answer can be looked up whenever it is needed.

This is a common method of speeding up programs.

It's called using a look-up table.

Amstrad CPC core

```

10 REM AL'S GORITHMS ... ELLIPSES
20 REM (c) LET'S COMPUTE!
30 MODE 1
35 INK 0,0:INK 1,6:INK 2,24:INK 3,26
40 PAPER 1: PEN 0
50 CLS
60 PRINT:PRINT "JUST A MO, CALCULATIN
G...."
70 REM LOOK-UP TABLE
80 DIM T(750,2):DEG
90 FOR I=0 TO 750
100 LET T(I,1)=COS (I/2)
110 LET T(I,2)=SIN (I/2)
120 LOCATE 5,5:PRINT I
130 NEXT I
140 CLS
150 FOR P=0 TO 27
160 READ M1,M2,IC,XC,YC,CL
170 GOSUB 200: REM DRAW ELLIPSE
180 NEXT P
190 GOTO 190
200 REM ELLIPSE ROUTINE
210 PLOT -5,-5,CL
220 LET S=1+500/(M1+M2)
230 LET XC=XC/2:LET YC=YC*5/12:LET IC=
IC*2
235 LET XC0=M1+T(IC,1)/2:LET YC0=M1*T(
IC,2)*5/12
240 LET XC1=XC+XC0:LET YC1=YC+YC0
245 LET XC2=XC-XC0:LET YC2=YC-YC0
250 FOR A=0 TO 360 STEP S
260 MOVE XC,YC
270 LET X=M1*T(A,1)
280 LET Y=M2*T(A,2)
290 LET XT=(X*T(IC,1)-Y*T(IC,2))/2+XC
300 LET YT=(X*T(IC,2)+Y*T(IC,1))/5/12+
YC
310 DRAW XT,YT:DRAW XC2,YC2
320 NEXT A
330 RETURN

```

Spectrum core

```

10 REM AL'S GORITHMS ... ELLIPSES
20 REM (c) LET'S COMPUTE!
30 PAPER 7
40 INK 0
50 CLS
60 PRINT:PRINT "JUST A MO, CALCULATIN
G...."
70 REM LOOK-UP TABLE
80 DIM T(750,2)
90 FOR I=1 TO 750
100 LET T(I,1)=COS (I*P1/360)
110 LET T(I,2)=SIN (I*P1/360)
120 PRINT AT 1,0; I
130 NEXT I
135 FOR I=0 TO 6 STEP 2: POKE USR "A"+I,BIN 01010101: POKE USR "A"+I+1,BIN 101
01010: NEXT I
140 FOR I=0 TO 21: PRINT AT I,0;" "
150 FOR P=0 TO 27
160 READ M1,M2,IC,XC,YC,CL
170 GOSUB 200: REM DRAW ELLIPSE
180 NEXT P
190 GOTO 190
200 REM ELLIPSE ROUTINE
210 INVERSE 1:IF CL=0 THEN INVERSE 0
220 LET S=1+500/(M1+M2)
230 LET M1=M1/6: LET M2=M2/6: LET XC=XC/
6: LET YC=YC/6: LET IC=IC*2+1
235 LET XC0=M1+T(IC,1): LET YC0=M1*T(I
C,2)
240 LET XC1=XC+XC0:LET YC1=YC+YC0
250 FOR A=1 TO 721 STEP 5
260 PLOT XC1,YC1
270 LET X=M1*T(A,1)
280 LET Y=M2*T(A,2)
290 LET XT=(X*T(IC,1)-Y*T(IC,2))
300 LET YT=(X*T(IC,2)+Y*T(IC,1))
310 DRAW XT-XC0,YT-YC0
315 DRAW -XT-XC0,-YT-YC0
320 NEXT A
330 RETURN

```

ST (Stos) / Amiga (Amos) core

```

10 REM AL'S GORITHMS ... ELLIPSES
20 REM (c) LET'S COMPUTE!
30 KEY OFF:MODE 0:HIDE ON:CURS OFF
40 PALETTE $0,$700,$700,$777
50 REM
60 PRINT:PRINT "JUST A MO, CALCULATIN
G...."
70 REM LOOK-UP TABLE
80 DIM T#(72,2)
90 FOR I=0 TO 72
100 LET T#(I,1)=COS (RAD (I*5))
110 LET T#(I,2)=SIN (RAD (I*5))
120 LOCATE 5,5:PRINT I
130 NEXT I
140 INK 3:BAR 0,0 TO 319,199
150 FOR P=0 TO 27
160 READ M1,M2,IC,XC,YC,CL
170 GOSUB 170: REM DRAW ELLIPSE
180 NEXT P
190 GOTO 160
200 REM ELLIPSE ROUTINE
210 INK CL
220 LET XC=XC/4:LET YC=YC/5:LET M1=M1/
4:LET M2=M2/5:LET OXT#=XC+M1*T#(I/5,1):L
ET OYT#=YC+M1*T#(I/5,2)
230 LET XC=320-XC:YC=200-YC
240 LET OXT#=320-OXT#:OYT#=200-OYT#
250 FOR A=0 TO 360 STEP 15
260 LET X#=M1*T#(A/5,1)
270 LET Y#=M1*T#(A/5,2)
280 LET XT#=X#+T#(IC/5,1)-Y#+T#(IC/5,2)
)+XC
290 LET YT#=X#+T#(IC/5,2)+Y#+T#(IC/5,1)
)+YC
300 POLYGON XC,YC TO OXT#,OYT# TO XT#,
YT#
310 LET OXT#=XT#:OYT#=YT#
320 NEXT A
330 RETURN

```

Amiga users: Replace Line 30 with:

```

30 SCREEN OPEN 0,320,,,200,16,LOWRES:HI
DE:CURS OFF

```

NOTE: Line 140 contains 32 graphic characters. To use one, go into graphics mode and type the letter A.

To get into graphics mode press the key labeled GRAPH or press Caps Shift and 9. The cursor will then appear as **G**. Press the same key to leave graphics mode.

Until you RUN the program the character will show as A. Once it has been run it will look like it is in the listing above.



ALAN'S ALGORITHMS

THIS IS IT! The page where the budding artists among you can pick up a tip or two. And a chance for you to show what **YOU** can do yourself.

Making a lot with a few lines of code is what it's all about. Alan McLachlan gives you some more bright ideas.

SQUASHING THE CIRCLES

Two issues ago we created some great pictures from circles. But squash the circles – some just a little bit and some a lot – and you've got lots more shapes to draw with.

So this month we're going to make even better pictures from ellipses – a fancy name for flattened circles. We'll show you how you can draw an ellipse of any size and shape. And to add even more fun you can also tilt it about its centre.

So the listing is a little more complex than before. It has to work out how much to squash the ellipse and how much to tilt it. But you don't need to know how it works to draw your own pictures. Just change the 27 in Line 150 to the number of ellipses you want to draw.

Then put the numbers that the program needs to draw the ellipses in DATA lines starting at Line 340. Each ellipse needs six numbers. You'll see them in each of the DATA lines opposite. They have to be entered in this order:

When you've keyed in the main core of the program you're ready to draw your own pictures.

But before you do so let your computer draw the Mickey Mouse shown above.

To do this, enter these DATA lines:

340 DATA 150,150,0,300,300,0	480 DATA 180,100,110,680,360,3
350 DATA 150,150,0,300,700,0	490 DATA 140,60,110,680,360,0
360 DATA 260,260,0,650,500,0	500 DATA 140,100,140,700,450,3
370 DATA 160,100,20,750,340,1	510 DATA 60,30,50,760,560,0
380 DATA 160,120,0,640,360,3	520 DATA 60,30,50,764,554,3
390 DATA 160,120,140,640,580,3	530 DATA 200,90,70,860,560,0
400 DATA 120,40,160,720,700,3	540 DATA 200,90,70,866,554,3
410 DATA 160,120,90,780,500,3	550 DATA 80,60,90,760,460,3
420 DATA 80,40,140,710,620,0	560 DATA 50,40,90,920,760,0
430 DATA 74,34,140,710,620,3	570 DATA 40,25,120,700,280,1
440 DATA 70,30,146,788,688,0	580 DATA 30,20,120,680,300,0
450 DATA 64,24,146,788,688,3	590 DATA 36,18,120,676,300,1
460 DATA 50,30,140,710,600,0	600 DATA 50,30,40,600,420,0
470 DATA 40,20,140,792,672,0	610 DATA 44,28,40,604,416,3

When you RUN it you'll find that the result is quite impressive.

But can you come up with something better?

The challenge is there!

Send us your masterpiece drawn using just ellipses and let everyone see it!

Order	What it does
First	Measures the distance across one way
Second	Measures the distance across the other
Third	Gives the angle of tilt (0 to 180)
Fourth	Gives the X location of the centre
Fifth	Gives the Y location of the centre
Sixth	Gives the colour



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yourself
with the
Safe Scientist

GOOD HEALTH?

Do you know what's good for you? Then try this fun survey. It gives a score based on your answers to a few questions. And it could open your eyes.

Try it. But be honest - pick the choice which is nearest to the truth.

The program gives a mark of 2 for the healthiest answer and 0 for the least healthy.

After each question you are also given some advice about what might have been the best answer. So you can learn from the program.

But to be a really good scientist you must carry out as big a survey as possible. So why not check the health of your friends?

Keep a record of the results and plot them on some kind of a chart.

You might even be able to say something about the health of your school. Or even the whole population of the country.

If you know something about programming you can easily extend or alter the program. For example, you can have more than 10 different questions.

Whatever you do with the program, remember that there is more to life than your computer screen. Good old fresh air and exercise really are important!

● Next month you'll need your sunglasses at the ready.

- We'll be investigating the dazzling world of colour!

```
10 REM HEALTHY LIFE STYLE
20 REM By The Safe Scientist
30 DIM S(3)
40 MODE 3:VDU19,0,4;0;
50 FOR N=23 TO 1 STEP-1
60 LET X=32:LET Y=N:GOSUB 400:PRINT "HEALTHY LIFESTYLE"
70 LET Y=N+1:GOSUB 400:PRINT "":REM 16 SPACES
80 LET T=10:GOSUB 420
90 NEXT N
100 LET SC=0
110 READ Q$:IF Q$<>"end" THEN GOSUB 16
0:GOTO 110
120 GOSUB 300
130 PRINT:PRINT "PRESS SPACE TO TRY AGAIN."
140 GOSUB 440:IF AS<>" " THEN GOTO 140
150 RUN
160 REM QUESTION
170 PRINT:PRINT Q$ 
180 FOR N=1 TO 3:READ AS,S(N)
190 PRINT:PRINT N;" ";AS
200 NEXT N
210 PRINT
220 INPUT "Which choice";C:IF C<1 OR C
```

```
>3 THEN GOTO 220
230 LET SC=SC+S(C)
240 PRINT:PRINT "You scored ";S(C);" for that."
250 READ MS:PRINT:PRINT MS
260 PRINT:PRINT "PRESS SPACE"
270 GOSUB 440:IF AS<>" " THEN GOTO 270
280 CLS
290 RETURN
300 REM SCORE
310 CLS
320 PRINT "You have scored ";SC
330 PRINT:PRINT
340 IF SC=20 THEN PRINT "Perfect! What a healthy little soul you are!":RETURN
350 IF SC>15 THEN PRINT "Pretty good! You know what's good for you.":RETURN
360 IF SC>10 THEN PRINT "Not bad, but some aspects could be healthier.":RETURN
370 IF SC>5 THEN PRINT "Do more to make sure you stay healthy.":RETURN
380 IF SC>1 THEN PRINT "Help! You need it if you value good health.":RETURN
390 PRINT "Check your pulse! With your lifestyle you're struggling.":RETURN
400 REM TAB(X,Y)
```

```
410 PRINT TAB(X,Y);:RETURN
420 REM DELAY
430 TIME=0:REPEAT UNTIL TIME>T:RETURN
440 REM GET
450 LET AS=GET$:RETURN
460 DATA "It is 7.15 on a Friday morning. Your alarm has just sounded."
470 DATA "Get up, wash and clean your teeth.",2
480 DATA "Turn the alarm off and go back to sleep.",0
490 DATA "Get up but be in a really bad temper.",1
500 DATA "Keeping clean is important. So is learning to rely on yourself."
510 DATA "It is now 7.45 and you are thinking about breakfast."
520 DATA "Skip breakfast because you haven't time.",0
530 DATA "Tuck into bacon and eggs with fried bread.",1
540 DATA "Have a bowl of cereal and fruit juice.",2
550 DATA "It is most important to start the day with a well balanced meal."
560 DATA "Twenty to nine and you are in
```

IS THIS YOUR COMPUTER?



Electron/BBC/Archimedes

The program works as shown.

Commodore 64/128

Enter the program in capitals.
Change the following lines:

```
40 PRINT CHR$(147);
60 LET X=10:LET Y=N:GOSUB 400:PRINT "HEALTHY LIFESTYLE"
280 PRINT CHR$(147);
310 PRINT CHR$(147);
410 POKE 211,X:POKE 214,Y:SYS 58732:RETURN
430 LET T=TIME+T*3
435 IF T>TIME THEN 435
436 RETURN
450 LET GET AS:IF AS="" THEN 450
455 RETURN
```

Spectrum

Change or add the following lines:

```
40 CLS
50 FOR N=20 TO 1 STEP-1
60 LET X=8:LET Y=N:GOSUB 400:PRINT "HEALTHY LIFESTYLE"
410 PRINT AT Y,X,:RETURN
425 LET T=PEEK(23672)*T/2:IF T>255 THEN
N LET T=T-256
430 IF PEEK(23672)<T THEN GOTO 430
435 RETURN
450 LET AS=INKEYS:IF AS="" THEN GO TO
450
455 RETURN
```

PC (GW-Basic)

Change the following lines:

```
40 CLS
410 LOCATE Y,X:RETURN
430 LET T=TIMER+T/8:WHILE T>TIME:WEND
:RETURN
450 LET AS=INKEYS:WHILE AS="" :LET AS=INKEYS:WEND:RETURN
```

Atari ST (Stos)

Change the following lines:

```
40 MODE 1:KEY OFF:CURS OFF:RIDE
50 FOR N=21 TO 1 STEP-1
610 LOCATE X+T,Y+T:RETURN
430 LET T=TIME+T*3:WHILE T>TIME:WEND
:RETURN
450 LET AS=INPUTS(1):RETURN
```

Amiga (Amos)

Change the following lines:

```
40 CLS
50 FOR N=21 TO 1 STEP-1
610 LOCATE X+T,Y+T:RETURN
430 LET T=TIME+T*3:WHILE T>TIME:WEND
:RETURN
450 LET AS=INPUTS(1):RETURN
```

Amstrad CPC

Change the following lines:

```
40 MODE 2
410 LOCATE X+1,Y+1:RETURN
430 LET T=TIME+T*3:WHILE T>TIME:WEND
:RETURN
450 LET AS=INKEYS:WHILE AS="" :LET AS=INKEYS:WEND:RETURN
```

Health in the National Curriculum

You need to know something about diet and a healthy life style.

You are also expected to know that some things, like tobacco, really are bad for you.

ow at school."

570 DATA "Tuck into a Mars bar you bought on the way to school.",1

580 DATA "Nip round the back of the bike shed for a quick fag.",0

590 DATA "Play a game of tennis with your mates.",2

600 DATA "It's not a bad idea to get some FRESH air and exercise."

610 DATA "At last! It's morning break time."

620 DATA "Race to the tuck shop for some bags of crisps.",0

630 DATA "Nip into the toilets to brush your hair and have a chat.",1

640 DATA "Play a game of tennis with your mates.",2

650 DATA "Better to avoid greasy, salty tuck. Exercise is much more useful."

660 DATA "It's the dreaded double maths lesson."

670 DATA "Quietly eat the Polo mints you bought earlier.",1

680 DATA "Just get on quietly with the problems you've been set.",2

690 DATA "Claim to feel ill so that yo

u can escape to the medical room.",0

700 DATA "You'll feel much better if you stick to your set tasks."

710 DATA "Hurrah! It's lunchtime."

720 DATA "Eat the balanced 'meal of the day'.",2

730 DATA "Tuck into hot dog and chips.",1

740 DATA "Skip dinner so you can keep the money you were given.",0

750 DATA "Once again, the well balanced meal is best."

760 DATA "It's games this afternoon."

770 DATA "Take a full and active part in the game.",2

780 DATA "Forge a note from your mum to say you are ill.",1

790 DATA "Skip off and hide in the toilets.",0

800 DATA "You may or may not enjoy it but the exercise is good for you."

810 DATA "School has ended. You are now back at home thinking about tea."

820 DATA "Scoff a couple of chocolate bars and a bag of crisps.",1

830 DATA "Eat a tuna fish salad.",2

840 DATA "Don't bother with tea because you're watching Neighbours.",0

850 DATA "You need that well balanced meal again."

860 DATA "After tea, what a range of activities are possible."

870 DATA "Go to the park to play with your mates.",2

880 DATA "Flop in front of the telly for the evening.",0

890 DATA "Sit in your room doing your homework.",1

900 DATA "Get the fresh air and exercise but make sure homework is done."

910 DATA "Your parents tell you it is time for bed."

920 DATA "Settle down because you know your bed time is sensible.",2

930 DATA "Pretend to settle down but get up later to see the horror movie.",0

940 DATA "Ask Dad about dinosaurs' intestines to hang out bed time.",1

950 DATA "You really need your sleep."

960 DATA "end"

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3.70 6.70	- -	3.70 6.70	* English Words (12+)	3.70 4.45	7.45 7.45	7.45	7.45
3.70 6.70	- -	3.70 6.70	* Gen. Science (14+)	3.70 4.45	7.45 7.45	7.45	7.45
3.70 6.70	- -	3.70 6.70	* Nat. History (10+)	3.70 4.45	7.45 7.45	7.45	7.45
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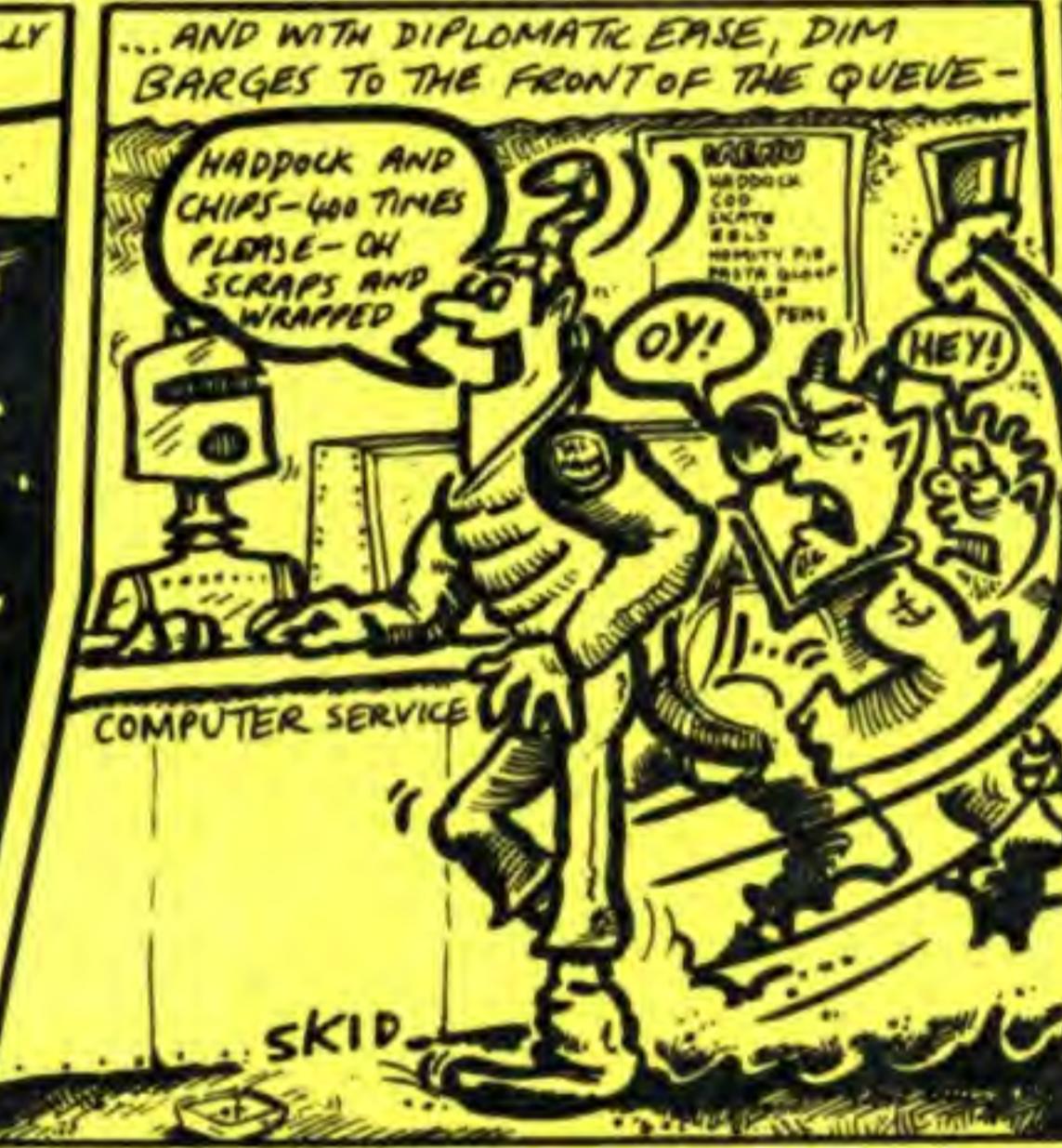
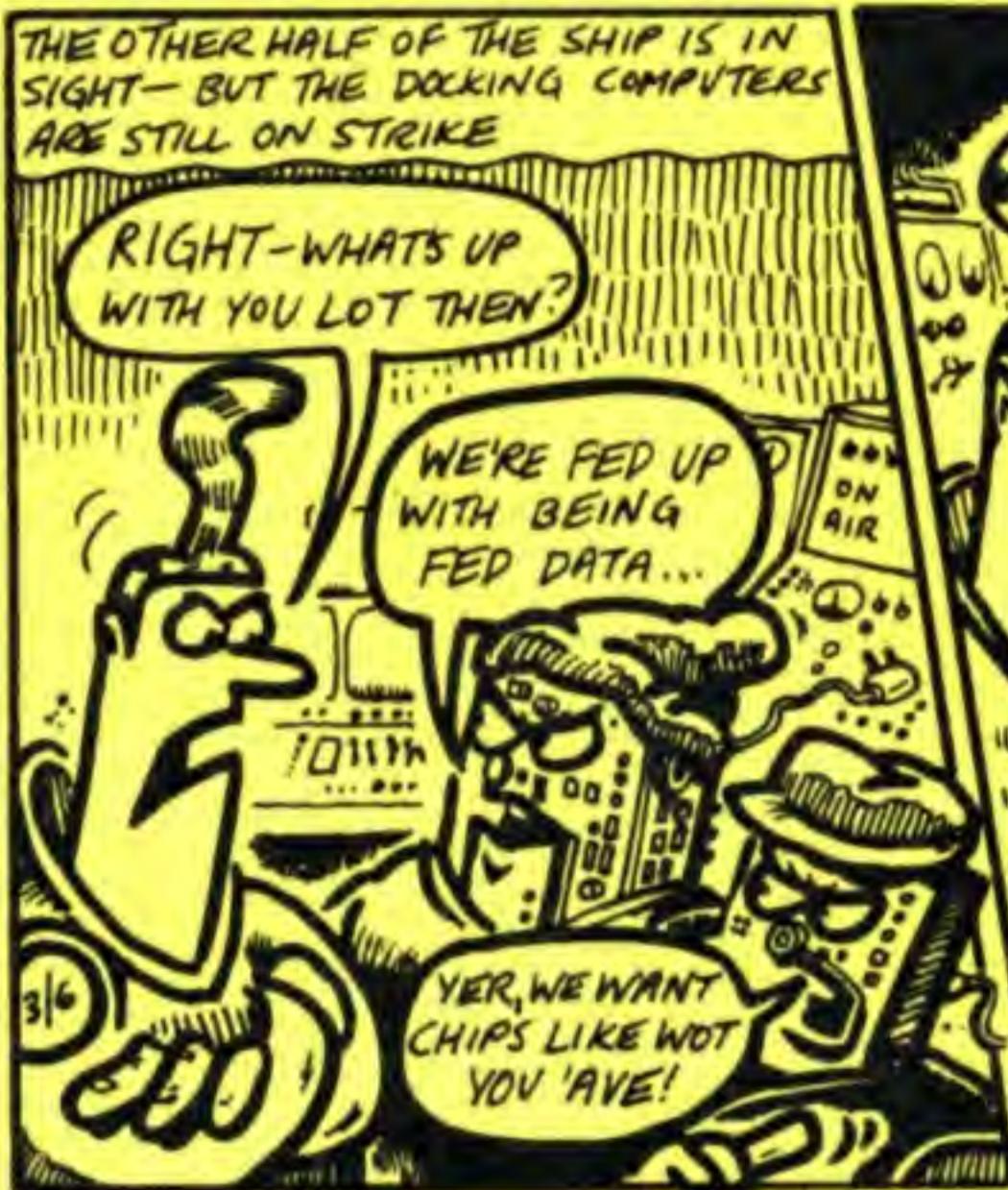
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FIRST THE LEFT EAR. THEN THE RIGHT EAR, AND NOW
THE FINAL FRONT-EAR



LET'S MAKE MONEY!

Discover how easy it is to use your computer to raise funds

If you ask someone how to raise funds using a computer the answer you often get is: "Let people play computer games and charge them".

But it's just not worth the effort. Look at the costs involved:

Suppose a game lasts about five minutes. And you charge 20p a go.

In an hour the most you can make is £2.40. This means that at an event like a school fair you'd be lucky to get a fiver.

If you liven up the challenge by offering a cash prize for the highest score of the day you could even lose money. And don't forget that while the games are being played your keyboard, joystick or mouse will get quite a bashing.

So can computers be used in fund-raising events?

The answer is YES. But there are three important things to remember:

- Make sure it's going to be profitable.
- Try to do something unusual. That way, if it's advertised, it will bring people to the event to see it.
- Don't do anything that may damage or quickly wear out your computer.

Over the next few months, Let's Compute! will look at ways computers like yours have been used to raise money. If you have any fund-raising ideas you have tried, let us know.

Fairgrounds often have a stall printing pictures of people on T-shirts. The personalised shirts cost up to £10 each.

Do it at a school fair and you can easily make lots of cash. And it's a great attraction.

You need at least one computer and a printer. You also need a video camera and digitiser. Many education authorities loan these to schools which don't have their own.

The other bit of equipment you'll need is a special ribbon. The panel on the right tells you where you can get them.

Set the equipment up in a bright corner of the hall. A spotlight and a good backdrop help, but aren't vital.

Then, with the special ribbon in your printer, just print pictures of people on ordinary paper. Next you use a hot iron to transfer them on to a T-shirt.

Rather than having stocks of shirts you can just sell the transfers for, say, £1. It's a good idea to have a ready made shirt on display to show the final result.

To speed up the process you can have more than one computer and printer working. To do that, don't have a printer connected to the computer the camera is plugged into.

Save the digitised picture on disc and take it to the computer with the printer. That way you can be taking the next picture while one is printing.

You can have several computers and printers on the go at once. If you have ordinary ribbons in some of the printers you can sell computer portraits on paper for, say, 40p.

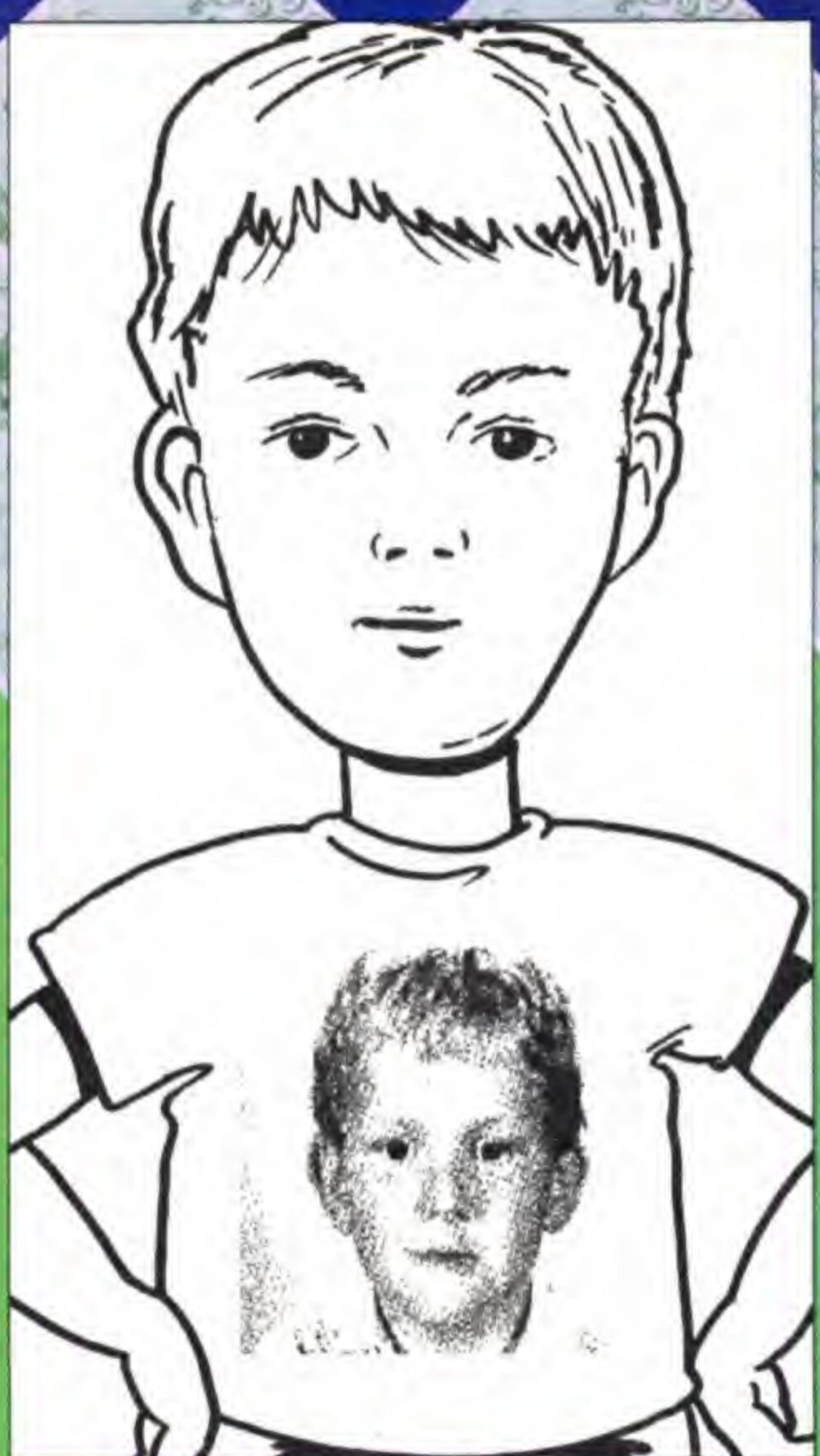
Using just one computer and printer you can do about one picture every five minutes.

That's 12 an hour - or about 25 in an afternoon.

A special ribbon costs about £10. So if you take £25 you're left with only £15 profit. But it's a great attraction and there are always lots of people around the stall.

One good tip: Put it next to a very profitable stall and you'll get even more customers!





The special ribbons

To get pictures on T-shirts you need heat-transfer ribbons. They look like ordinary ribbons and the printout looks the same.

But if you place the printout on a T shirt and iron over it the picture is transferred to the cloth.

A ribbon costs about £10 from Morley Electronics (091-257 6355) or Care Electronics (0923 672102).

The pictures on this page were all taken at a school fair. The equipment used was the school's BBC Micro and Epson printer together with a borrowed digitiser and video camera.

Transfers for T-shirts were sold for £1 and ordinary digitised pictures for 25p. About £18 profit was made on the stall during the afternoon.

FURTHER IDEAS

Use a digitised picture on a "Wanted" poster or fun newspaper page. Just prepare the poster or page beforehand. Then you only have to fill in a name and fit the picture.

If you can't get a digitiser and camera, you can still sell T-shirt transfers. People could put any message they want on them.

Remember you'll need to get the computer to print the mirror image of any words. Then they come out right when they're ironed on.

• You can get art programs for most computers to do this. You should really do it with pictures of people as well. But it takes time and nobody usually notices that face is the wrong way round!

Creating and editing BASIC programs is fun with



BET is a set of tools designed to make the creation and editing of BASIC programs a real pleasure.

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The eight software houses listed below will each adopt one *Let's Compute!* reader for a year. From January to December 1991 the lucky winners will get a copy of each new release from that software house.

AND THAT'S NOT ALL!

Each of the eight winners will also receive the impressive Certificate of Adoption shown here.

It will be signed by the software house and is a promise of a full 12 months' supply of games.

WHAT YOU HAVE TO DO

Simply fill in the answers to the five questions on the entry form on the right. Then send it to *Let's Compute!* before December 31.

PLUS

To complete this incredible prize each winner will also get lots of goodies from the software house. There are loads of posters, badges and other special bits and pieces waiting for them all.

ELECTRONIC ARTS

With USA and UK offices, their PC games are some of the most innovative you can get. They already have *Silpheed*, *Battle Chess* and *Populous* to their credit. The winner with a PC will get **ALL** their releases next year.



Calling all Atari ST owners. A copy of each of next year's US Gold coin-op and original games could be yours. They have some of the best graphics and sound around. Can you afford not to enter the contest?



Supreme on the BBC/Electron, they now want to adopt someone who has one of these micros. With 1990 titles like *Hostages*, *SimCity*, *Superior Golf* and *Soccer* under their belts, 1991 looks like being a very exciting year.



Famous for budget titles, their full-priced games are often top of the charts. The lucky person they adopt will be the first to know what they have on offer for Commodore 64 owners in 1991.



The Fourth Dimension

Producing more and more Archimedes games, 4th Dimension will be giving away a whole host of exciting games due to be released next year. With past hits like *E-type* and *Holed Out* there are bound to be several classics coming up.



Some of the best Amiga programmers around are working on their 1991 releases. Mirrorsoft are offering a very special year of games to one lucky Commodore Amiga owner.

will *sleigh* you!



LET'S COMPUTE!

 This is to certify that



Stoned



ZEPPELIN GAMES
of such a
winner now

Games for the Spectrum are still many and various. Zeppelin produce some of the most original and unusual. With a pedigree such as Draconus, the be in for a busy year.



The logo for Code Masters, featuring the company name in a stylized, italicized font inside a circular emblem with a textured, metallic appearance.

With a well-earned reputation for quality and quantity they produce all types of games. From

simulators to shoot-'em-ups, Code-masters do lots for the Amstrad CPC. The winner will get plenty of chances to practise invstick techniques.

THE QUESTIONS

1. Which reindeer had the red nose?
a) Rudolph b) Randolph c) Prancer

2. The Scots give New Years Day a special name. What is it?
a) First Foot b) Hogmanay
c) Twelfth Night

3. What is the December 26 called?
a) Christmas Day b) Christmas Eve
c) Boxing Day

4. What did the Three Wise Men bring to the baby Jesus?
a) Gold, silver and jewels
b) Gold, frankincense and myrrh
c) Lamb, a camel and a donkey

5. Christmas decorations should be taken down on which date?
a) Twelfth Night
b) Boxing Day
c) New Year's Day

ENTRY FORM

Name _____

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ANSWER

Answers (please tick)

1. a b c
2. a b c
3. a b c
4. a b c
5. a b c

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- Commodore 64 (disc)
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- Spectrum (disc)
- Amstrad CPC (tape)
- Amstrad CPC (disc)
- Commodore Amiga
- Atari ST
- A3000/Archimedes
- IBM PC compatible (3.5in disc)
- IBM PC compatible (5.25in disc)

WRITE THE CARDS

Last month we started creating the Let's Compute! Card Index Database. Now Roland Waddilove shows what to do next

What is a database?

A database is a collection of facts and figures. We are surrounded by them.

A bus or train timetable is a database. So is the list of programmes in Radio Times.

We often use a database to look up facts and figures. But it takes time to find out information when it's only written on paper.

How long would it take you to go through the phone book and find the number of Mr Smith who lives at 57 High Street, Manchester? You would have to spend ages wading through pages of Smiths looking for the right address.

But ring directory enquiries and you'll be told the correct number in a flash.

How do they do it?

The answer is that everyone's name, address and telephone number is stored on a computer.

The operator types in a name, presses a few more keys and, hey presto, the number is displayed on the screen.

Last month we started building our database by creating the main menu screen. This month we'll add more lines to the program so you'll be able to enter information on to the blank cards.

The section of code you need is in Lines 4000 to 4100. It is a subroutine called Write on Card.

Line 4000 is a REM to tell us what the following lines do. The next line sets a counter, called X, which points to the first card.

Line 4020 searches for the first card that hasn't been written on. It contains an asterisk character, which is what the program is looking for.

There can be up to five lines of text on each card. So a FOR ... NEXT loop (Lines 4050 to 4090) is used to put the lines into the array CS. This is where the card information is held. If you want to leave a blank line just press Return without typing anything else.

But what if you make a mistake while entering information? Or if you change your mind after typing something in and want to throw away a card? A second subroutine starting at Line 5000 will sort things out.

Again, a REM at the start tells us what the subroutine does. Then Lines 5010 and 5020 search for cards that have information written on them. That means any card that hasn't got an asterisk.

When a card is found it is printed on the screen. You are then asked whether this is the card you want to throw away.

All you need to do is type Y or N. Your answer is read by the INPUT instruction in Line 5080.

Type in these two subroutines and try selecting Choices 4 and 5 from your menu. You can now enter some information and try throwing away cards or enter some new information.

But let's face it: A database isn't much use if you have to enter the information each time you want to use it!

Next month you'll find out how to save your cards on to tape or disc.

CARD INDEX DATABASE

1. Load a box of cards
2. Save a box of cards
3. Read/search for a card
4. Write on a new card
5. Throw away old cards
6. Change something on a card
7. Print the cards
8. Sort the cards into order
9. Stop the program

Cards free=45/Cards used=6
What do you want to do?
Please type in a number (1-9)

```

4000 REM === Write on Card ===
4010 LET X=1
4020 IF CS(X)<>"*" AND X<255 THEN X=X+
5 : GOTO 4020
4030 PRINT "Enter 5 lines of text on t
his card..."
4040 PRINT
4050 FOR Y=0 TO 4
4060 PRINT "Line";Y+1;
4070 INPUT TS
4080 LET CS(X+Y)=TS
4090 NEXT Y
4100 RETURN
5000 REM == Throw away old cards ==
5010 LET X=1
5020 IF CS(X)="*" THEN GOTO 5100
5030 CLS
5040 FOR Y=0 TO 4
5050 PRINT CS(X+Y)
5060 NEXT Y
5070 PRINT
5080 INPUT "Throw away this card (Y or
N)";KS
5090 IF KS="y" OR KS="Y" THEN LET CS(X
)="*"
5100 LET X=X+5
5110 IF X<255 THEN GOTO 5020
5120 RETURN

```

TYPING TIP!

When you type things on your cards avoid commas (,) and quotes ("). On some computers these could make the program mess up your data.

IS THIS YOUR COMPUTER?

Electron/BBC/Archimedes/PC(GW BASIC)
Amstrad CPC/Atari ST(Stos)/Amiga(Amos)
The program will work as shown

Commodore 64/128

Change or add the following lines:

```

4050 FOR Y=0 TO 4:TS="*"
4075 IF TS="*" THEN 4090
5030 PRINT CHR$(147);

```

Spectrum

Change or add the following lines:

```

4020 IF CS(X)<>BS AND X<255 THEN LET X=X+
5 : GOTO 4020
4075 PRINT ":";TS
5020 IF CS(X)=BS THEN GOTO 5100

```

NEXT MONTH

You'll find out how to save your cards on to tape or disc

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Operating system available on ROM or 3.5" ADFS disc or Tape (state requirement)

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Gives exactly the same Mode 7 display screen as the BBC. Allows BBC Mode 7 software to run on the Electron: Magazine programs, Adventure games, Educational, Wordwise, Prestel, Teletext. Includes Prestel software - Prestel requires a modem and our RS423 adapter. You will need a ROM socket to hold the Mode 7 ROM, eg. in our RS423 adapter. For Mode 7 programs with HIMEM above 64000 you will need a Shadow RAM board. Fits inside the Electron, alongside the Shadow RAM Board.

Price £49 for you to fit, or £59 fitted.

Also available as a kit - board and ROM for £25 - you buy the components.

RS423 SERIAL CARTRIDGE

Connects the Electron to serial RS423/RS232 devices, eg. printers, modems. Allows the transfer of programs, data, etc. from one computer to another. Has the same socket, so uses the same leads as the BBC. Includes a socket for a 32k RAM or 16k ROM, eg. the Mode 7 ROM. Fits into a Plus One/ROMbox Plus slot.

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LET'S COMPUTE

Watch out! Santa's about!

Gadget Shop
boss Mike Cook
shows a clever
way you can
find out when
those Christmas
presents arrive

Santa Claus will soon be on his way. But the old chap moves around as quiet as a mouse. You never hear him delivering presents.

So how can you tell when he's arrived?

That's no problem for Gadget Shop fans. With the help of your computer you can catch him red handed. All you need to do is to link up a *Let's Compute!* Santa Claus detector.

In our October issue we used magnetic reed relays to detect doors opening. But that's no use if Santa doesn't open doors.

We need to detect his foot fall instead. To do this we have to use a pressure pad.

We'll look at two types of pad. The first you can make yourself out of odds and ends. The other you can buy ready made.

How does a pressure pad work?

Two contacts are held apart and the weight of someone stepping on them forces them together. When they touch it sends a signal to your computer.

You have two problems to solve: What to use for contacts and how to keep them apart. As you'll see it's really very easy.

You'll need some aluminium baking foil, some thin strips of plastic foam, a length of wire and a couple of pieces of cardboard about 10cm by 10cm.

Wrap one piece of card in baking foil. Then make eight holes in the other card as shown in the diagram on the right. Through these you should thread some wire - but strip the insulation off first. Make sure the wires lies flat

along the cardboard. The diagram shows how you should thread them.

It helps to hold them down with spots of glue. But make sure you don't use too much. Now connect the wires as shown.

Next you need to make a sandwich with the foam and the two pieces of card. The diagram below right shows you how it all goes together.

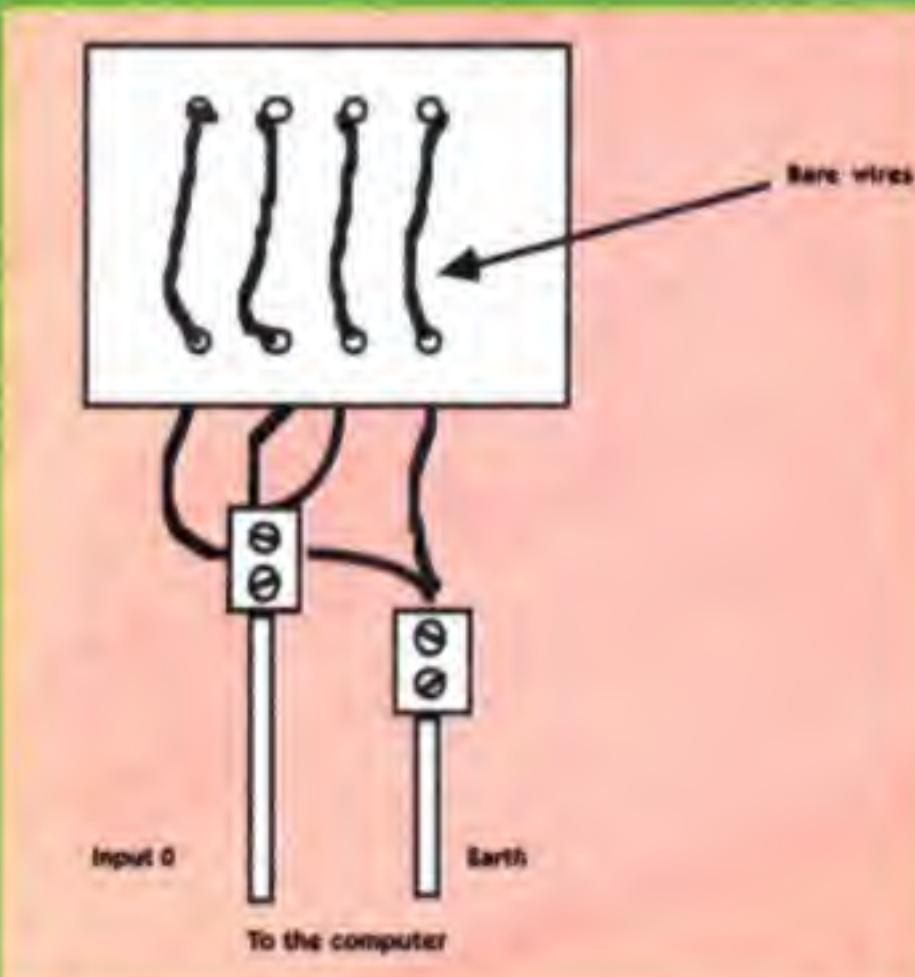
How hard you need to press on the pad to trigger it depends on how solid the foam is.

You may need to experiment with different thicknesses of foam for best results.

To conceal the pad simply slip it under the carpet. Near a door is best.

Make sure that the weight of the carpet doesn't trigger it off. If it does you will have to use thicker foam.

If you don't feel like making your



How to thread the wires through the card

IN THE SHOP SOON: ●

AUTO MONEY BOX



own pressure pads you can buy them from the Gadget Shop. These are black welded heavy duty PVC floor pressure pads. They measure 575mm by 170mm.

You can use as many pads as you have inputs to your computer. Acorn computers, except the Compact, have eight of them. Other makes, and the Compact, let you connect five.

To connect pads to your computer you need the Gadget shop Pack 1. This was explained in the August issue of *Let's Compute!* If you order one from the Gadget Shop you'll also get instructions.

The software is the same as for the burglar alarm described in October's *Let's Compute!* In case you missed it, details will be supplied when you buy a pad.

Are you good at programming?

Why not modify the software to record the time Santa arrives? Or make an even louder noise to wake you up?

If you want you can put the pressure pad in a different room

IS THIS YOUR COMPUTER?

BBC Micro: The gadget connects to the User Port.

Archimedes and BBC A3000: You need an i/o podule.

Electron: You need a Plus One and User Port expansion - available from Pres (0276 72046).

Spectrum: The gadget connects to the joystick port. You'll also need an Interface 1.

Amstrad CPC, Commodore 64/128, Amiga and ST: The gadget connects to the joystick port.

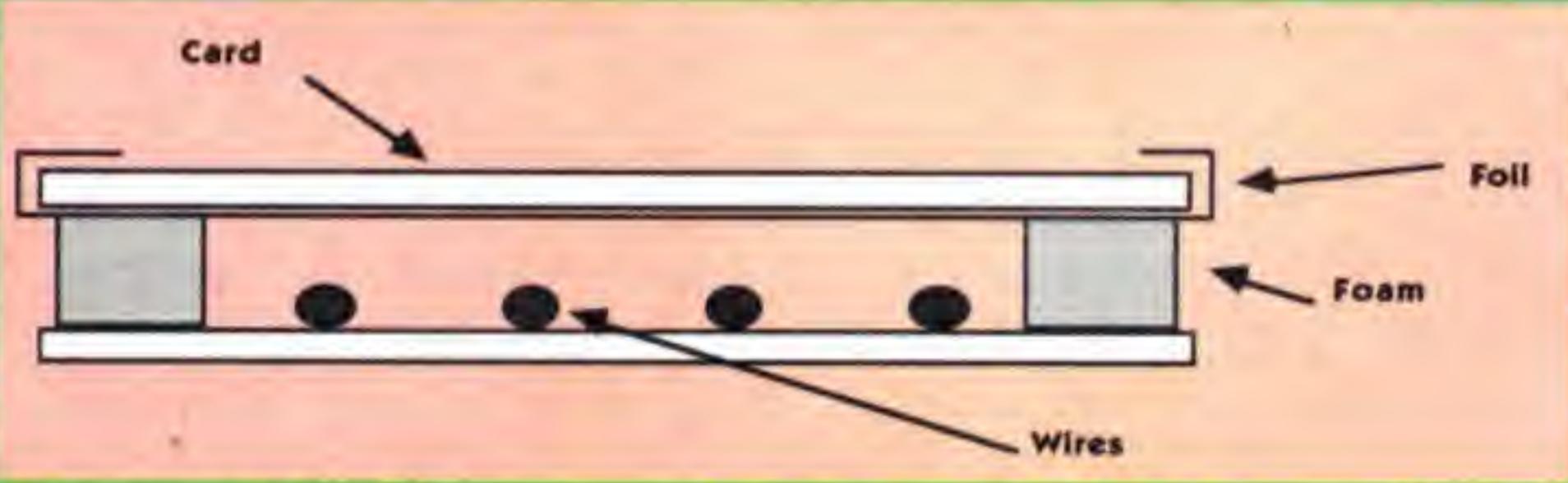
● The full assembly instructions are in Gadget Shop Packs 1 and 5. The short Basic routine to operate the gadget will be supplied when you order it.

to your computer. You can have several areas bugged and monitored from your own control room.

So, now you know how easy it is to detect that annual present intruder.

With all his great bulk and a sack of presents he'll certainly be caught by your trap.

Unless, of course, there is some other magic afoot!



The pressure pad sandwich

WEATHER STATIONS

NEXT MONTH

What is a joystick? Something you use to control a game by wobbling it with your hand? Not always!

Next month in *Let's Compute!* discover how you can make a unique joystick you control with your feet!

ORDER FORM

Pack 5 - Floor pressure pad

This pack contains a ready-made pressure pad ready to make your Santa Claus Detector. You also need the connector cable (Pack 1). This is still available and you can use this form to get one.

Show what you want by ticking the correct box below.

Floor pressure pad £3.55 each.

You'll also need Pack 1 - the User Port connector cable:

20 way IDC plug, length of 20 way ribbon cable, 12 way chock block, cardboard base, 2 foam sticky pads PLUS 2 spare connectors and a resistor £1.99

As above but with IDC plug ready connected ... £2.49

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As above but with connector for joystick port of Spectrum, Amstrad CPC, Commodore 64/128, ST or Amiga in place of IDC plug. Basic program and instructions will also be supplied ... £3.99

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Name

Address

Post code

How
good
is your
memory?
Here's a
game that
will put
it to the
test!

THE BRAIN GAME

J
F
A
G
C
H
S
U
G
A
U
R
A
A
G

In the popular game Simon you have to remember the sequence of four flashing lights. This unique Let's Compute! version uses the alphabet in place of the lights. But the idea is the same.

When you RUN the program the alphabet is shown on your computer screen. Press the spacebar to start. Arrows will point to a letter and then disappear.

All you have to do is remember which letter the arrows pointed to. Then press the same letter on your keyboard. You must use capital letters. If you get it right it will appear again, followed by a second letter.

You now have two keys to press. If you get them right another will be added and you have another go. So the pattern of letters keeps increasing one by one.

If you press the wrong letter your computer will show you the order in which you should have pressed the letters.

Now type the listing in, RUN it and test your memory!

POSSIBLE PROGRAM IMPROVEMENTS

- The program is set up so your computer can remember a pattern of 100 letters. If you think you can do better, change the DIM S(100) in Line 60 to, say, DIM S(500). The biggest number you're allowed to put there depends on the type of computer you're using.
- Put your own routine in the program to time how long it takes to type the letters. Make the program add some points to the score if you're quick.
- Add colour to brighten up the display.

```

10 REM THE BRAIN GAME
20 REM (c) LET'S COMPUTE!
30 LET AS="ABCDEFGHIJKLMNPQRSTUVWXYZ"
40 LET SS="":LET B=0
50 FOR N = 1 TO 5:LET SS=SS+SS:NEXT
60 DIM S(100)
70 LET W=40:LET X=RND(-TIME)
80 CLS
90 LET Y=3:LET MS="THE LET'S COMPUTE!
BRAIN GAME":GOSUB 340
100 LET Y=10:LET MS=AS:GOSUB 340
110 LET N=1:LET N=1
120 GOSUB 730
130 GOSUB 698
140 LET X=26:GOSUB 320:LET S(N)=X
150 LET Y=15:LET MS="WATCH!":GOSUB 340
160 FOR N=1 TO N
170 GOSUB 520
180 LET H=S(N):GOSUB 480
190 LET D=1:GOSUB 440:GOSUB 400
200 NEXT N
210 GOSUB 520
220 LET Y=15:LET MS="NOW IT'S YOUR GO"
:GOSUB 340
230 FOR N=1 TO N
240 LET F=0:GOSUB 460:IF KS<"A" OR KS>"Z" THEN GOTO 240
250 IF KS<>CHR$(S(N)+64) THEN LET F=1:
LET N=N
260 LET H=ASC(K$)-64:GOSUB 520:GOSUB 4
80:GOSUB 440
270 NEXT N
280 IF F=1 THEN GOSUB 620:GOTO 80
290 GOSUB 560
300 LET H=N+1:GOSUB 520:LET D=2:GOSUB
400:GOT0140
310 REM ** START OF SUBROUTINES **
320 REM RANDOM
330 LET X=RND(X):RETURN
340 REM PRINT MESSAGE
350 LET X=4:GOSUB 380:PRINT SS
360 LET X=(W-LEN(M$))/2-1
370 GOSUB 380:PRINT M$
380 REM TAB(X,Y)
390 PRINT TAB(X,Y);:RETURN
400 REM DELAY
410 TIME=0
420 IF TIME<0*100 THEN GOTO 420
430 RETURN
440 REM BEEP
450 VDU7:RETURN
460 REM GET A KEY
470 LET KS=GET$:RETURN
480 REM POINTERS
490 LET X=(W-30)/2+H:LET Y=9:GOSUB 380
:PRINT"V"
500 LET Y=11:GOSUB 380:PRINT" "
510 RETURN
520 REM CLEAR POINTERS
530 LET Y=9:LET MS=SS:GOSUB 340
540 LET Y=11:GOSUB 340
550 RETURN
560 REM WIN
570 IF (N-1)>8 THEN LET B=N-1
580 GOSUB 730
590 SOUND 1,-15,200,30
600 LET Y=15:LET MS="WELL DONE":GOSUB
340:LET D=2:GOSUB 400
610 RETURN
620 REM LOOSE
630 SOUND 1,-15,2,30
640 LET Y=15:LET MS="HARD LUCK":GOSUB
340:LET D=2:GOSUB 400:GOSUB 690
650 LET MS="HERE'S WHAT YOU SHOULD HAV
E DONE":GOSUB 340:LET D=1:GOSUB 400
660 FOR N=1 TO N
670 LET H=S(N):GOSUB 520:GOSUB 480:GOS
UB 440:GOSUB 400:NEXT N
680 RETURN
690 REM PRESS SPACE
700 LET Y=15:LET MS="PRESS SPACE":GOSU
B 340
710 GOSUB 460:IF KS<>" " THEN GOTO 710
720 RETURN
730 REM PRINT SCORE
740 LET Y=6:LET MS="SCORE "+STR$(N-1)+
LEFT$(SS,W/2)+"BEST "+STR$(B):GOSUB 340
750 RETURN

```

IS THIS YOUR COMPUTER?

Electron/BBC/Archimedes

The programs work as shown

Commodore 64/128

Enter the program in capitals

Change the following lines:

```

25 S=54272:POKE5+24,15:POKE5+6,248
88 PRINT CHR$(147);
338 LET X=INT(RND(0)*X)+1:RETURN
398 POKE 211,X:POKE 214,Y:SYS 58732:RETURN
418 TI$="900000"
458 DU=380:FR=32:GOSUB 888:RETURN
478 GET K$:IF K$="" THEN 470
475 RETURN
598 DU=800:FR=64:GOSUB 888
638 DU=800:FR=16:GOSUB 888
888 POKE S+1,FR:POKE S+4,17:FOR T=1 TO
DU:NEXT:POKE S+4,16:RETURN

```

Spectrum

Select 48k mode

```

78 LET W=34: RANDOMIZE
268 LET H=CODE (K$)-64:60 SUB 520:60 S
UB 480:GO SUB 440
338 LET X=INT (RND*X+1): RETURN
358 LET X=4: GO SUB 380: PRINT SS( 10
31)
398 PRINT AT Y,X: RETURN
418 LET T=PEEK (23672)+0*50: IF T>255
THEN LET T=T-256
428 IF PEEK (23672)<>T THEN GOTO 420
458 BEEP .2,9: RETURN
478 LET K$=INKEY$: IF K$="" THEN GO TO
470
475 RETURN
508 LET Y=11:GOSUB 380:PRINT"@"
538 LET Y=9:LET RS=SS( 10 26): GO SUB
340
598 BEEP 1.5,36
638 BEEP 1.5,-12
748 LET Y=6:LET RS="SCORE "+STR$ (N-1)
+SS( 10 W/2)+"BEST "+STR$ (B):GOSUB 340

```

Amstrad CPC

Change the following lines:

```

78 LET W=48:RANDOMIZE TIME
338 LET X=INT(RND*X+1):RETURN
390 LOCATE X+1,Y+1:RETURN
418 LET T=TIME+0*300
428 WHILE T>TIME:WEND
458 SOUND 1,142,20,15:RETURN
478 LET K$=INKEY$:WHILE K$=""LET K$=I
NKEY$:WEND:RETURN
508 LET Y=11:GOSUB 380:PRINT"@"
538 SOUND 1,28,150,15
638 SOUND 1,500,150,15

```

PC (GW-Basic)

Change the following lines:

```

78 LET W=48:RANDOMIZE TIMER
338 LET X=INT(RND*X+1):RETURN
390 LOCATE Y+1,X+1:RETURN
418 LET T=TIMER+0/2
428 WHILE T>TIMER:WEND
458 BEEP:RETURN
478 LET K$=INKEY$:WHILE K$=""LET K$=I
NKEY$:WEND:RETURN
508 SOUND 255,18
638 SOUND 150,8

```

Amiga and Atari ST

Use Amos or Stos

```

78 LET W=48:LET X=RND(TIMER)
88 MODE 1:KEY OFF:CURS OFF:HIDE:CL
ICK OFF
338 LET X=RND(X-1)+1:RETURN
390 LOCATE X,Y:RETURN
418 LET T=TIMER+0*300
428 WHILE T>TIMER:WEND
458 BELL:RETURN
478 LET K$=INPUTS(1):RETURN
508 VOLUME 10:PLAY 2,55,30:VOLUME 0
638 BEEP

```

Amos: Leave Line 80 as:

88 CLS

COMPUTER

EXPRESS

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A500 BATMAN PACK



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New Zealand Story	£24.99
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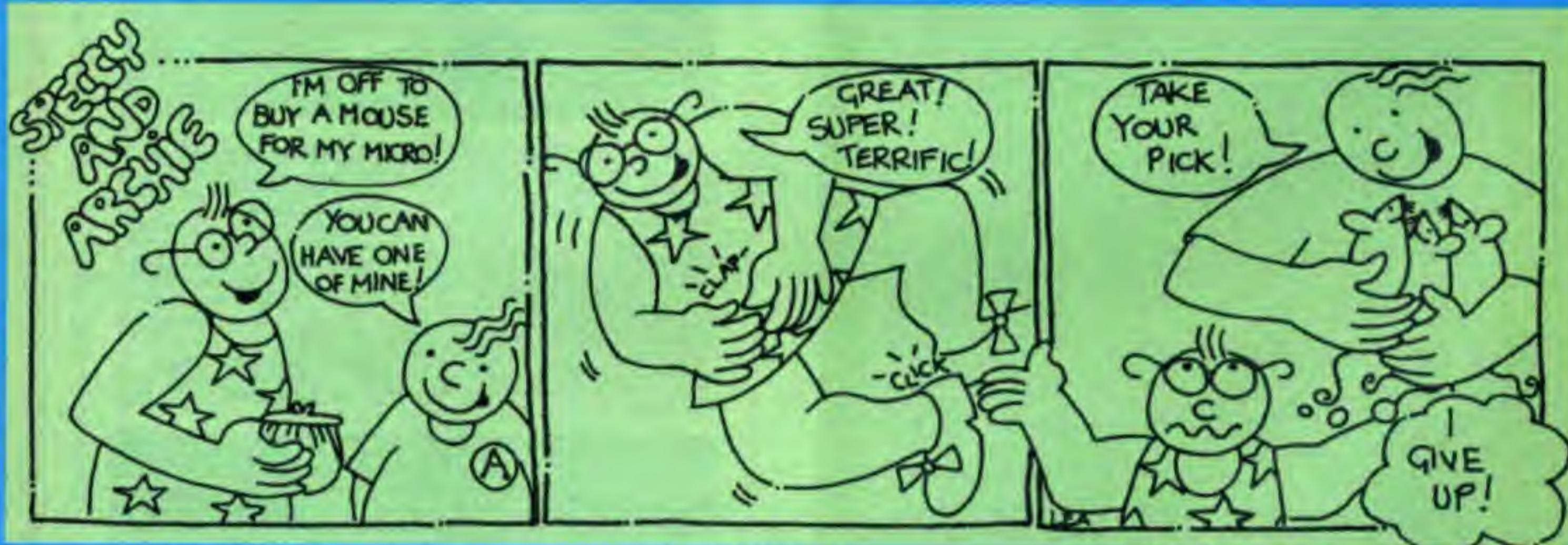
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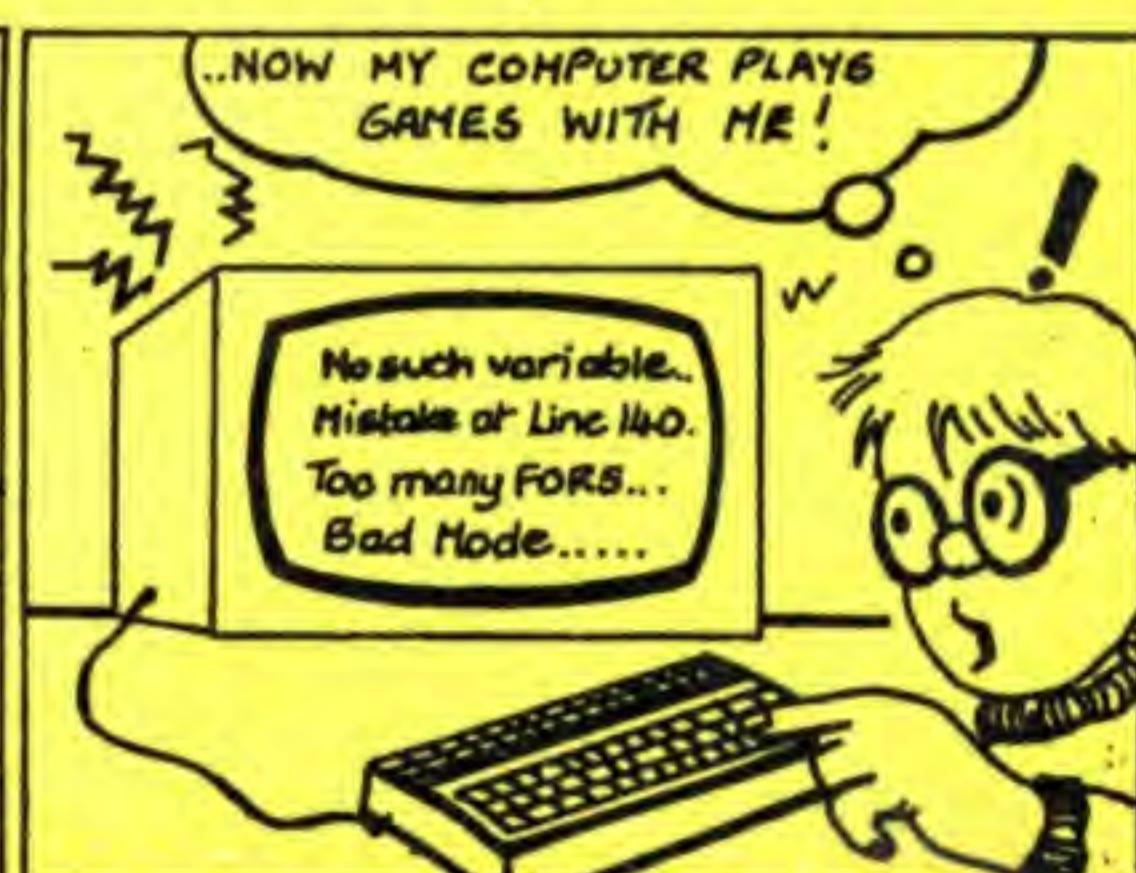
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**Future worlds
of Nucleus...
Can you destroy
the power core
before time runs
out?**

P	E	S	T

C	A	R	E

Entry form

Name.....

Address.....

Postcode

Age

Send this to: BugBash/Nucleus Contest, *Let's Compute!*
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one morning you see that the
normally beautiful garden is
untidy.**

**The usually helpful insects
have been brain-washed by the
Evil Slug. Only you with your
insecticide spray gun can put
everything right.**

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lovely sound effects this
garden-based blast-'em-up is
really good fun.**

Nucleus

**Set in a more futuristic world,
you have a mission to compete
against the clock.**

**You must destroy the electric
power core of the the planet
Cetorium.**

**If you succeed you will
destroy the alien invaders'
power supply. Fail and ...**



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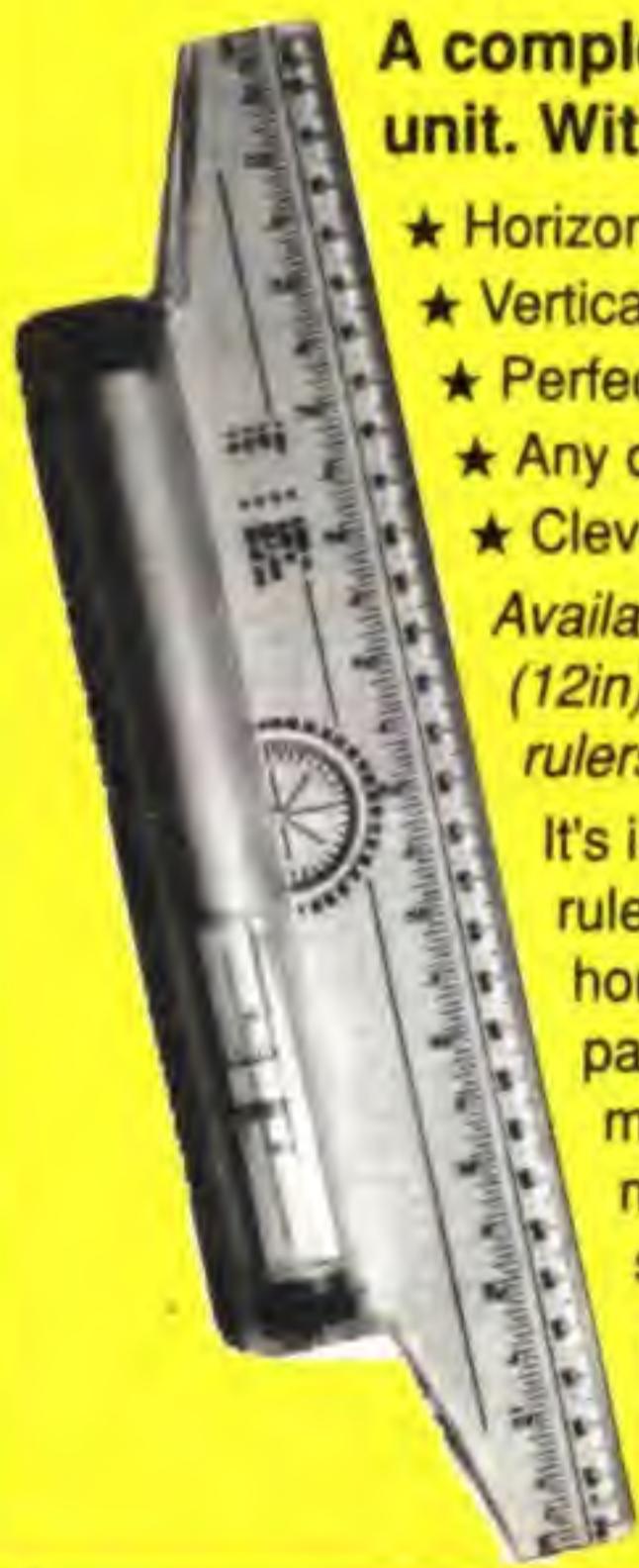
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LET'S
COMPUTE!

HIGH SCORE CHALLENGE!

Game	Computer	Score	Name	Age
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Arkanoid	Amstrad CPC	679,535	Clair Brooks	14
Bananaman	BBC	87,920	Eleanor Dickenson	11
Battle Tank	Archimedes	2,000	Alex Waddell	10
Bird Basher	BBC	Level 8	Katie Penny	10
Blitzkrieg	Electron	55,800	James Hollis	14
Bubble Bobble	Commodore 64	367,200	Nathan Phillips	9
Chuckie Egg	Electron	32,540	Tom Bason	11
Crack up	Electron	1,002,050	Mr B Asdown	18+
Despatch Rider	BBC	23,375	Ryan Simpson	10
E-Type	Archimedes	346,656	Gregg Bailes	13
Emellyn Hughes	Amstrad CPC	24-0	Steven Eddle	12
Firetrack	BBC	409,920	Matthew Thompson	16
Galactic Player	Amstrad CPC	2,380	Samantha Terrace	12
Galoforce	Electron	34,840	James Brand	15
Ghosts & Goblins	Atari ST	48,600	James Laidlow	13
Ghoules	BBC	754	Paul Taitting	8

Game	Computer	Score	Name	Age
Hopper	BBC	69,300	Winston Chambers	12
Hopper	Electron	12,330	James Jagger	12
Key Man	BBC	83,500	Jonathan Rawle	11
Killer Gorilla	BBC	12,600	Hestan Patel	11
Labyrinth	BBC	225,690	James Greenshield	12
Nevron	BBC	252,200	Satbir Shakoor	12
Pacmania	Archimedes	355,630	Mark Truman	13
Pipemania	Spectrum	70,450	Alan Whysall	14
Quitter	Archimedes	49,501	John Edwards	13
Rainbow Islands	Amiga	1,481,050	James Butler	13
Renegade	Commodore 64	375,150	Dermot Al Bergin	12
RoboCop	Amiga	238,880	Alex Crawford	15
Shadow Warriors	Spectrum	36,000	Paul Maggs	13
Skirmish	BBC	96,100	A. Jenkins	12
Stellar Rescue	BBC	1,420	Matthew Chatterley	11
WOW2	Amstrad CPC	80,102	James Notean	10
Zarch	Archimedes	11,311	Jon Bell	8

Send us YOUR scores NOW!

Name.....

Computer.....

Address.....

Game.....Score.....

.....

Game.....Score.....

Age.....

Game.....Score.....

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Animated Numbers



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A2000

Your own logo disc or tape for £1!

Turtle graphics is a vital part of any Logo program. And that's what Turtle Logo is. Specially written for the Electron, BBC Micro and A3000/Archimedes series, it is on the tape or disc that comes with the Let's Compute! Club bumper pack.

You can find out how to join the Club on Page 32 - and about all the other goodies sent out to members.

However, if you only want Turtle Logo we'll send it to you for just £1 if you complete and return the coupon below

KNOT LOGO?

Oh yes it is!

Noel Turtle is always losing things. He searched everywhere for a star to put on his Christmas tree. But the poor Christmas turtle couldn't find one.

So he decided to make his own. He made a knot in the shape of an interweaving eight-pointed star.

The program he used to do it is shown below.

You can easily draw a star using Noel's program. The result will be like the star Noel is seen putting on top of his Christmas tree.

You first need to run the Logo language. This is available for most computers.

If you haven't got Logo and you're using an Acorn computer the Let's Compute! Turtle Logo is an ideal starting point - see the offer on the left.

Once your Logo language is running type in Noel's program. Then save it by entering:

SAVE "STAR"

Now the program's in your computer you can see Noel's star by typing:

STAR8 50

To draw stars of different sizes just change the 50 to another number.

If you're using the Let's Compute! Turtle you can make the star twinkle. To do this add an extra line before the END of STAR8. On that line



you just
put the word
TWINKLE. Then add
these four lines to the end of the program:

```
TO TWINKLE  
DOFOREVER  
INK RANDOM 8  
END
```

Like before, just type STAR8 50 to see the star being drawn. Once it is complete it will start twinkling.

Can you draw an interesting, interweaving pattern in Logo? If you can we'd love to see it.

Post it to: Let's Compute! Adlington Park, Macclesfield SK10 4NP.

There's a super Let's Compute! baseball cap for the writer of every one we print.

ORDER FORM

Please send me the Let's Compute! Turtle Logo. I enclose cheque, postal order or stamps the value of £1.
(Only suitable for Electron, BBC Micro or Archimedes series.)

Name _____

Address _____

Post code _____

Age _____

Please send it on:

- 5.25in 40T disc
- 5.25in 80T disc
- 3.5in disc
- Cassette

SEND TO:

Logo Offer,
Let's Compute!
Europa House
Adlington Park
Macclesfield
SK10 5NY

```
TO STAR8 :SIZE  
RT 22.5  
OUTER :SIZE  
RT 90  
JUMP :SIZE  
LT 90  
JUMP :SIZE * 24 / 10  
INNER :SIZE  
END  
TO OUTER :SIZE  
REPEAT 8  
[FD :SIZE * 24 / 10  
JUMP :SIZE * 14 / 10  
FD :SIZE * 34 / 10  
RT 135]  
END  
TO JUMP :SIZE  
PU  
FD :SIZE * 41 / 100  
FD  
END  
TO INNER :SIZE  
REPEAT 8  
[FD :SIZE * 14 / 10  
JUMP :SIZE * 18 / 10  
FD :SIZE * 14 / 10  
JUMP :SIZE * 14 / 10  
FD :SIZE * 2  
RT 135]  
END
```

Note: If you're using Let's Compute! Turtle Logo enter the program as it is printed.

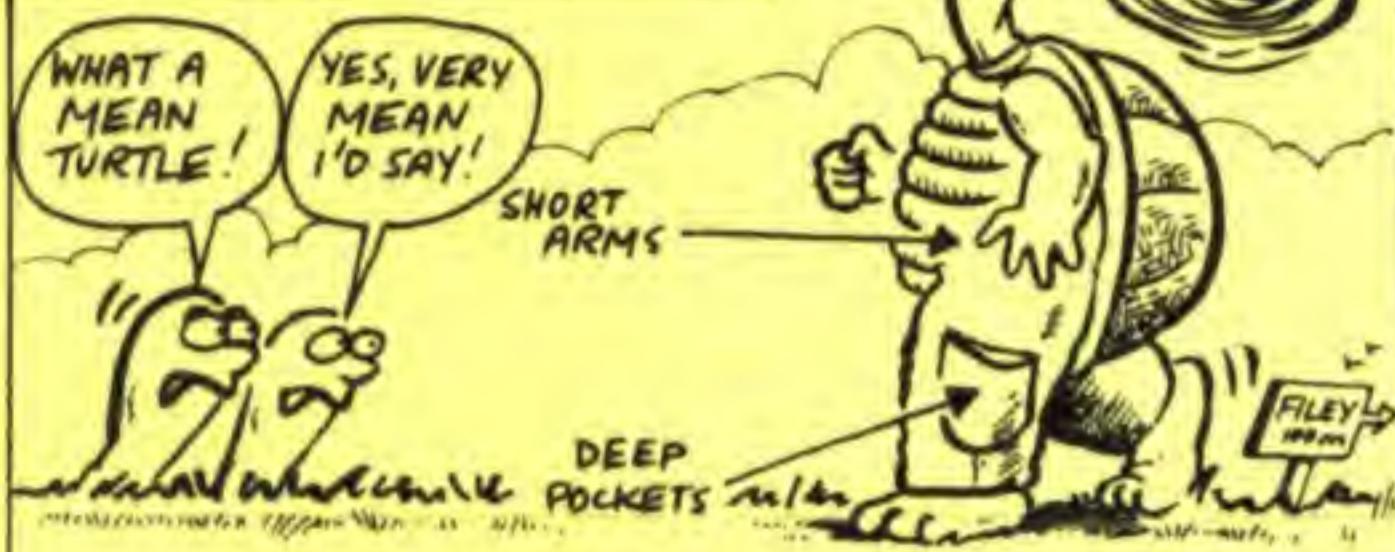
If you're using Logotron Logo, put the [and everything following it up to the] on the same line as REPEAT 8. Do not press Return until you have typed].

If what you are typing is too long to fit on one line of the screen, Logotron Logo puts : at the end of your line and lets you continue on the next one. Ignore the : and imagine you are still typing one line.

Other versions of Logo have different ways of treating REPEAT if it won't all go on one line. Most of them are similar to the two we've mentioned so check your instructions.

LOGO LOWDOWN

BY MICHAEL NOELS



A. BECAUSE THEY NEVER SHELL OUT!

— AN EXSHELLENT JOKE

Q. WHY ARE
TURTLES
MEAN?

LAST MONTH THE TURTLE TOTS
LEARNT HOW TO DO SUMS

SUMS

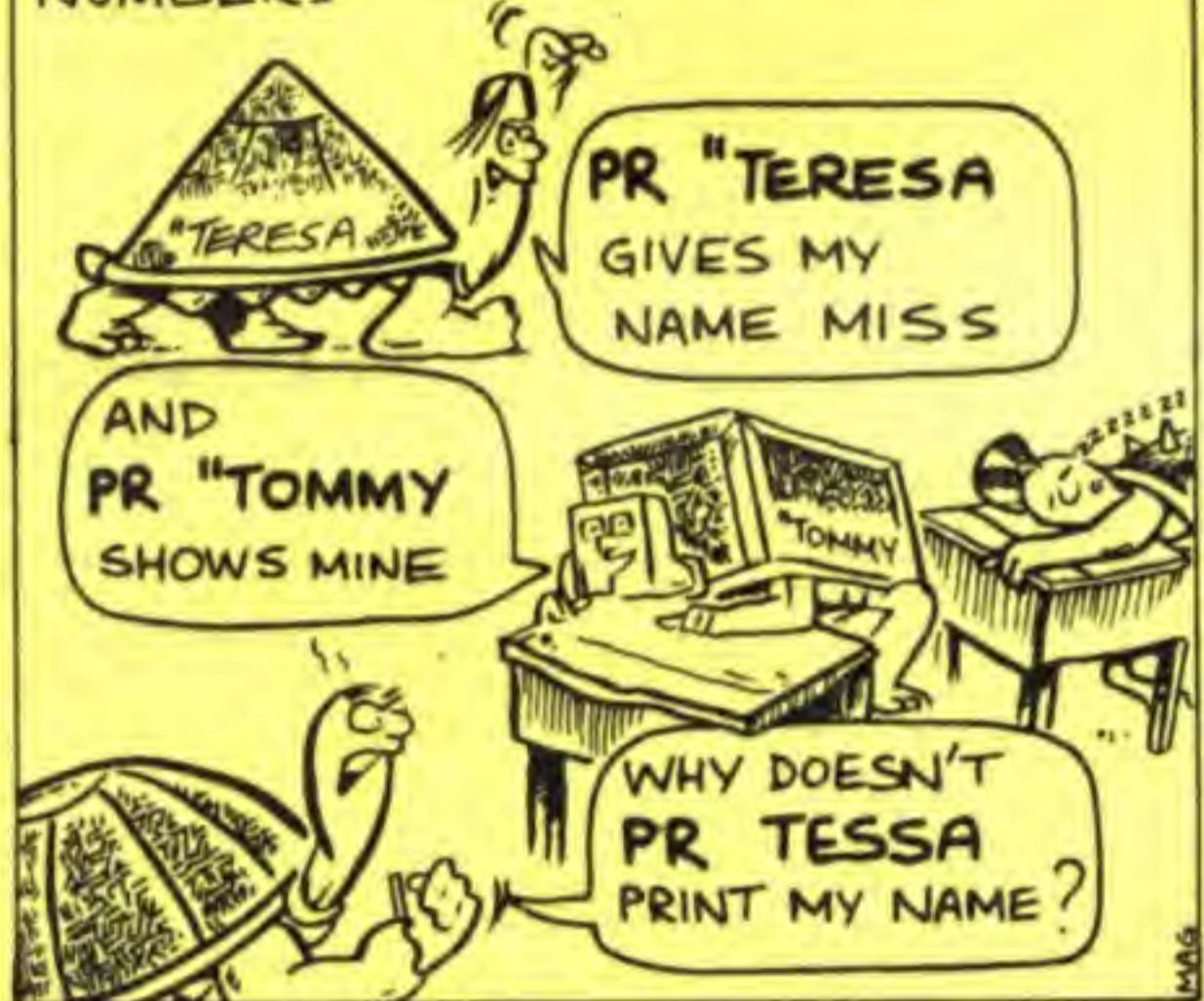
PR $2 + 2$

RULES

- A. PR STANDS FOR PRINT
- B. USE * FOR MULTIPLY
USE / FOR DIVIDE
- C. LEAVE SPACES BETWEEN
EVERYTHING

SO THAT'S THE
ABC OF
DOING SUMS

THEN THE TOTS FOUND THAT **PRINT**
COULD DO MORE THAN PRINT OUT
NUMBERS



WELL, YOUR NAME IS A WORD ISN'T IT?
LOGO ALWAYS WANTS TO SEE **QUOTES**"
IN FRONT OF WORDS.

PR TESSA HASN'T ANY QUOTES.



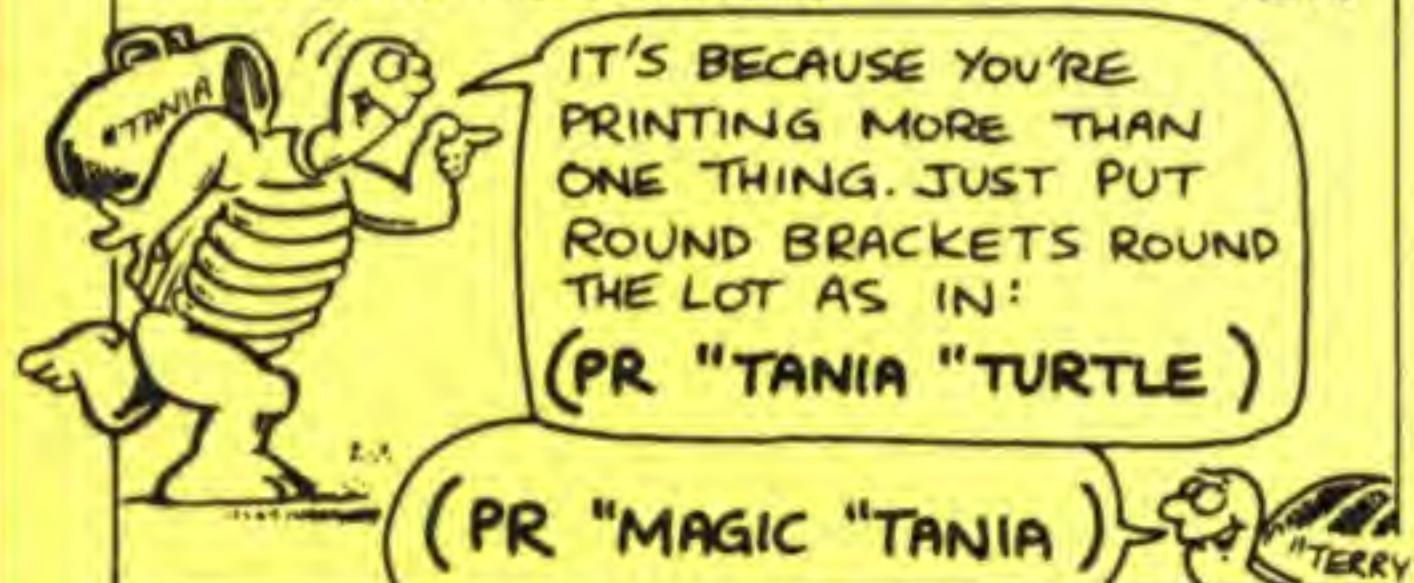
TERRY TURTLE GOT REALLY UPSET...

IT WON'T LET ME PRINT MY
FULL NAME. I'VE TRIED

PR "TERRY TURTLE"
AND

PR "TERRY "TURTLE"
BUT LOGO WON'T DO IT.

TANIA HAD THE ANSWER:



TURTLE TIP

SO **PRINT** CAN PRINT OUT MORE
THAN ONE WORD

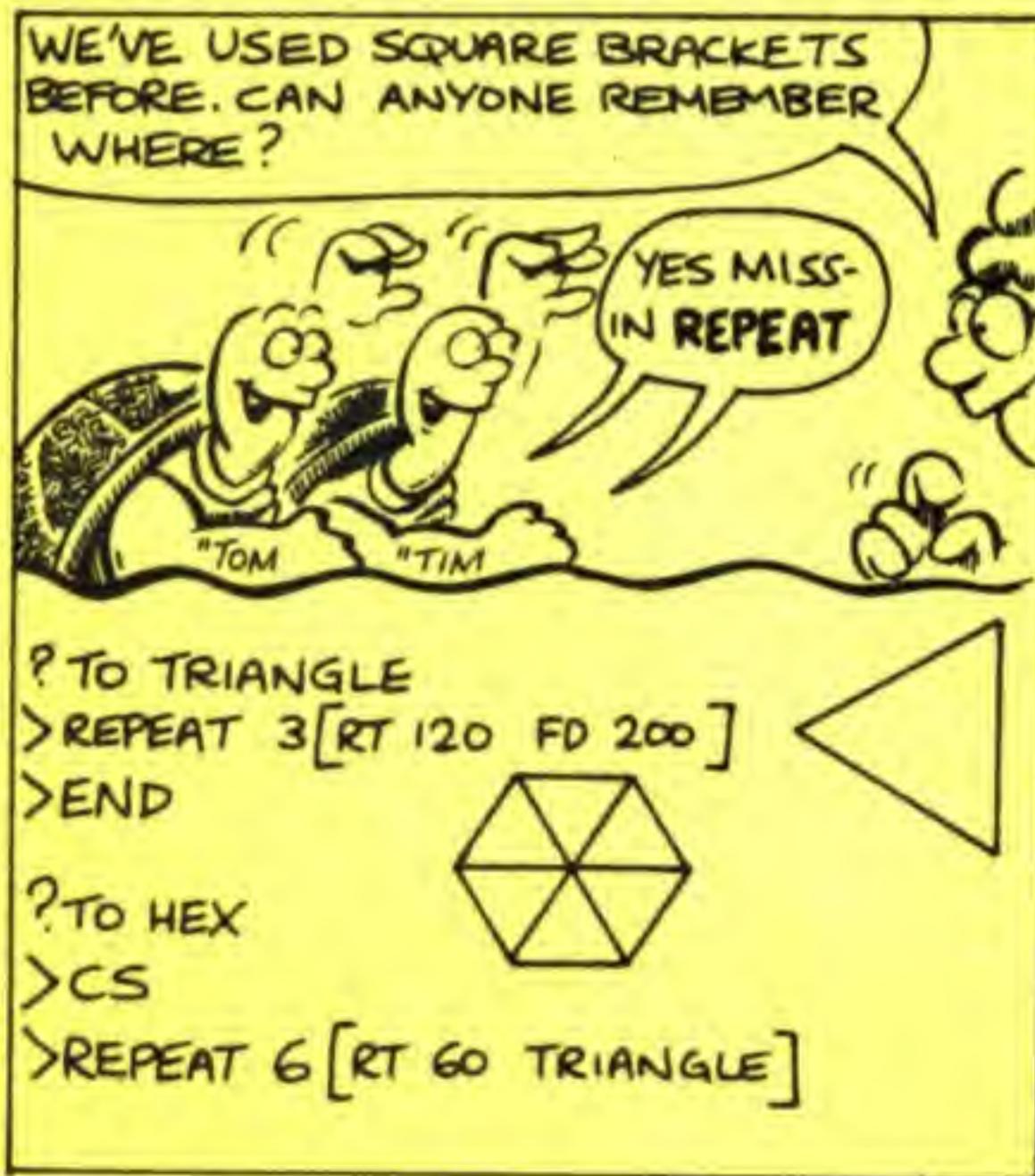
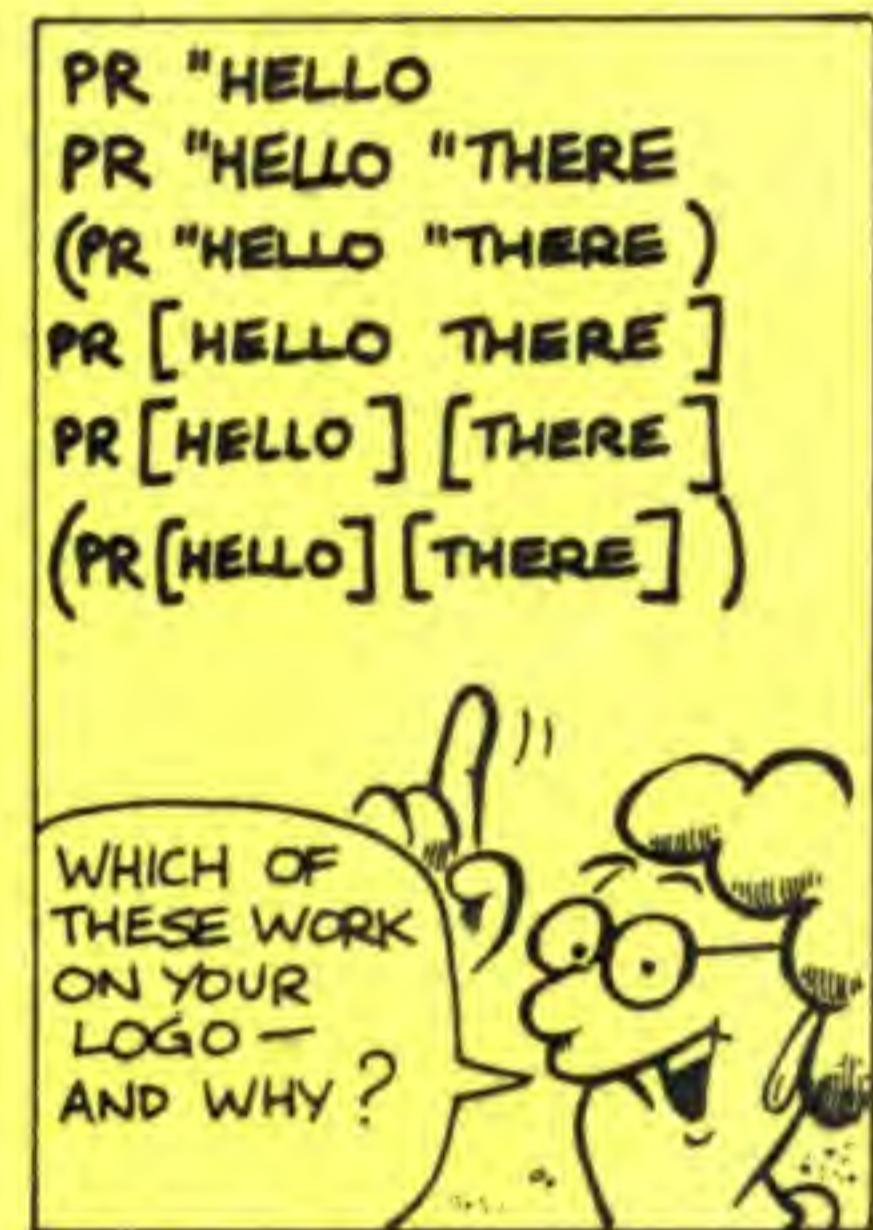
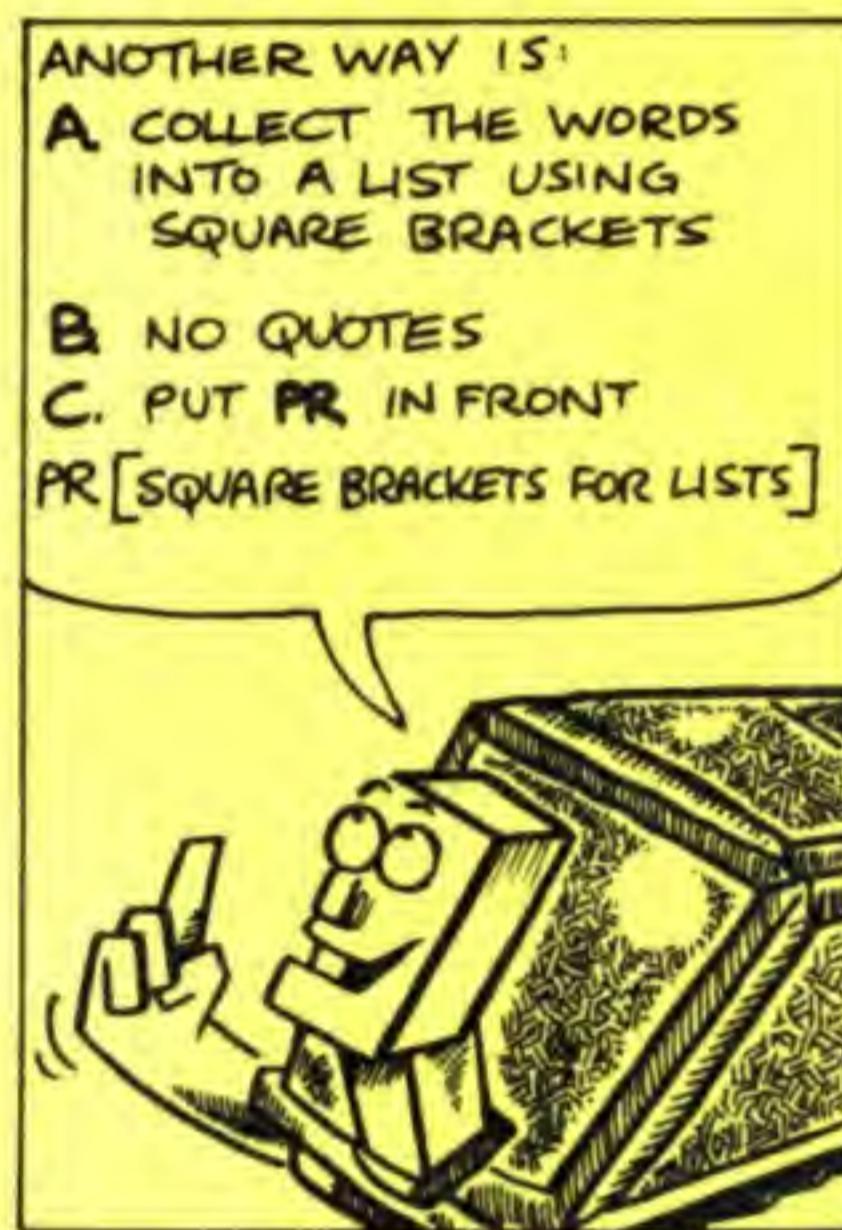
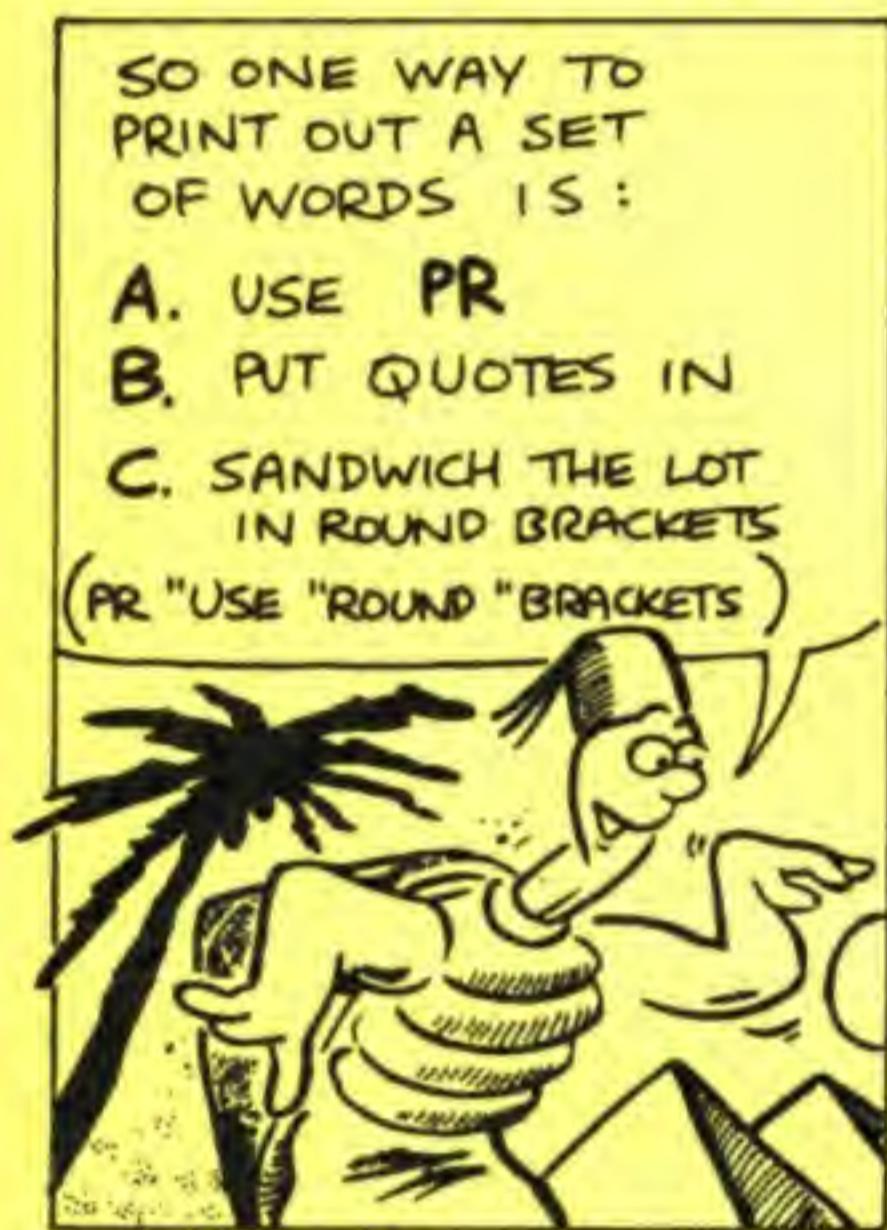
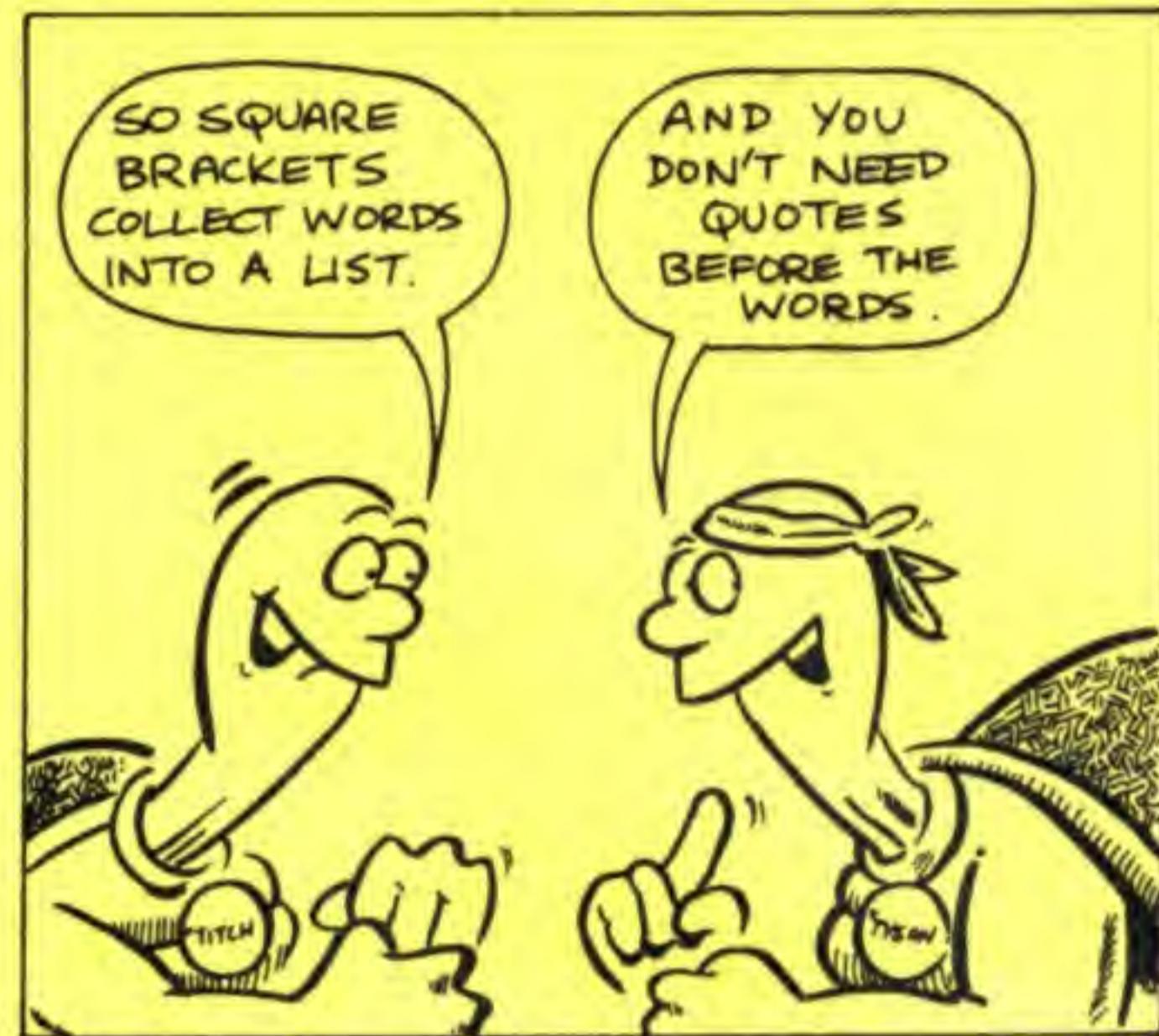
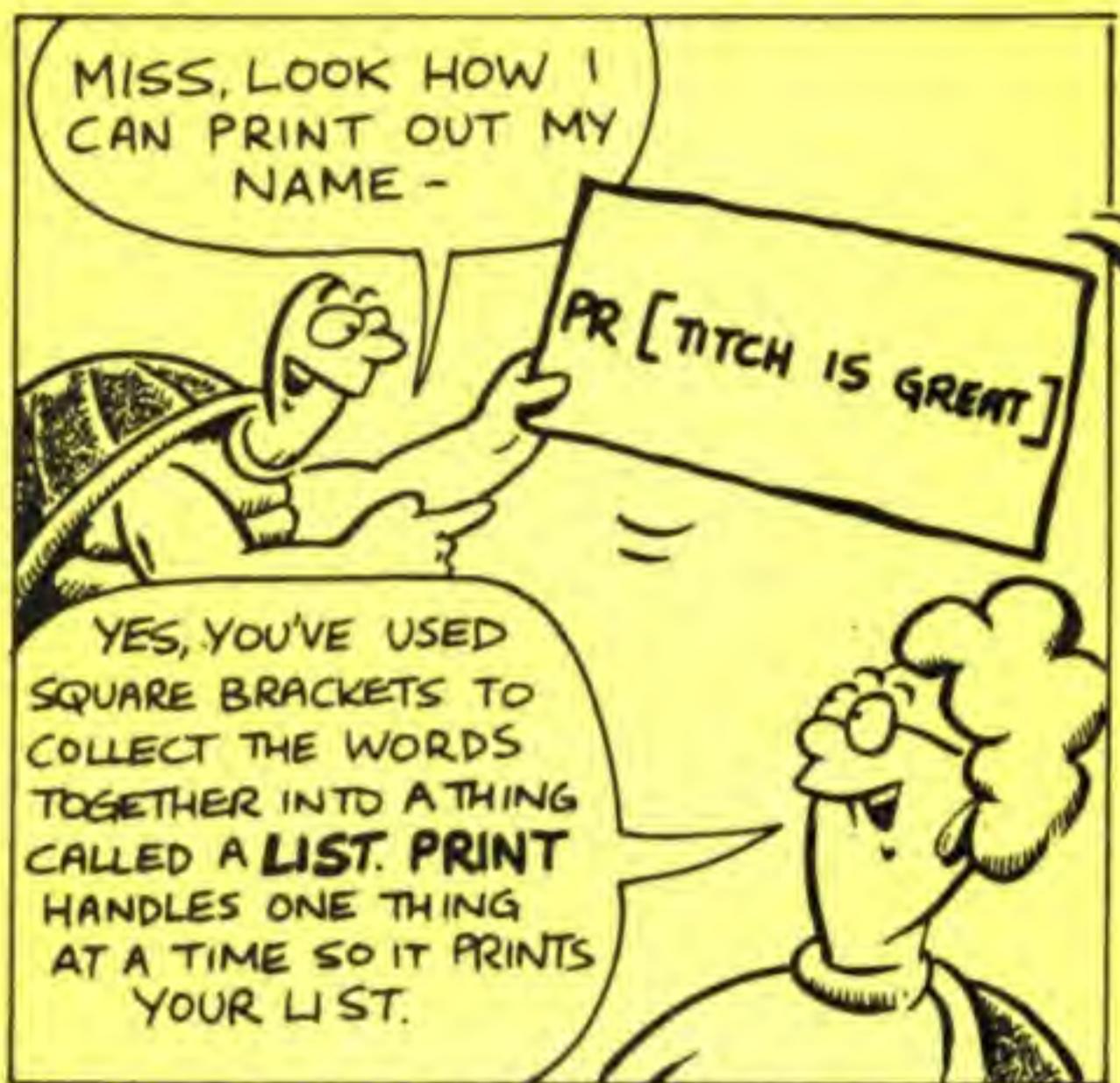
BUT *ooo*

ooo "EACH "WORD" STARTS
"WITH "QUOTES

ooo SURROUND THE LOT-
INCLUDING **PRINT** - WITH BRACKETS

PR "A "TURTLE "SANDWICH"

ROUND BRACKETS MAKE
PRINT GREEDY FOR WORDS.
SOME LOGOS WON'T DO THIS!



THAT'S RIGHT. WHEN WE USE **REPEAT** WE PUT THE LIST OF INSTRUCTIONS WE WANT TO REPEAT INSIDE SQUARE BRACKETS.



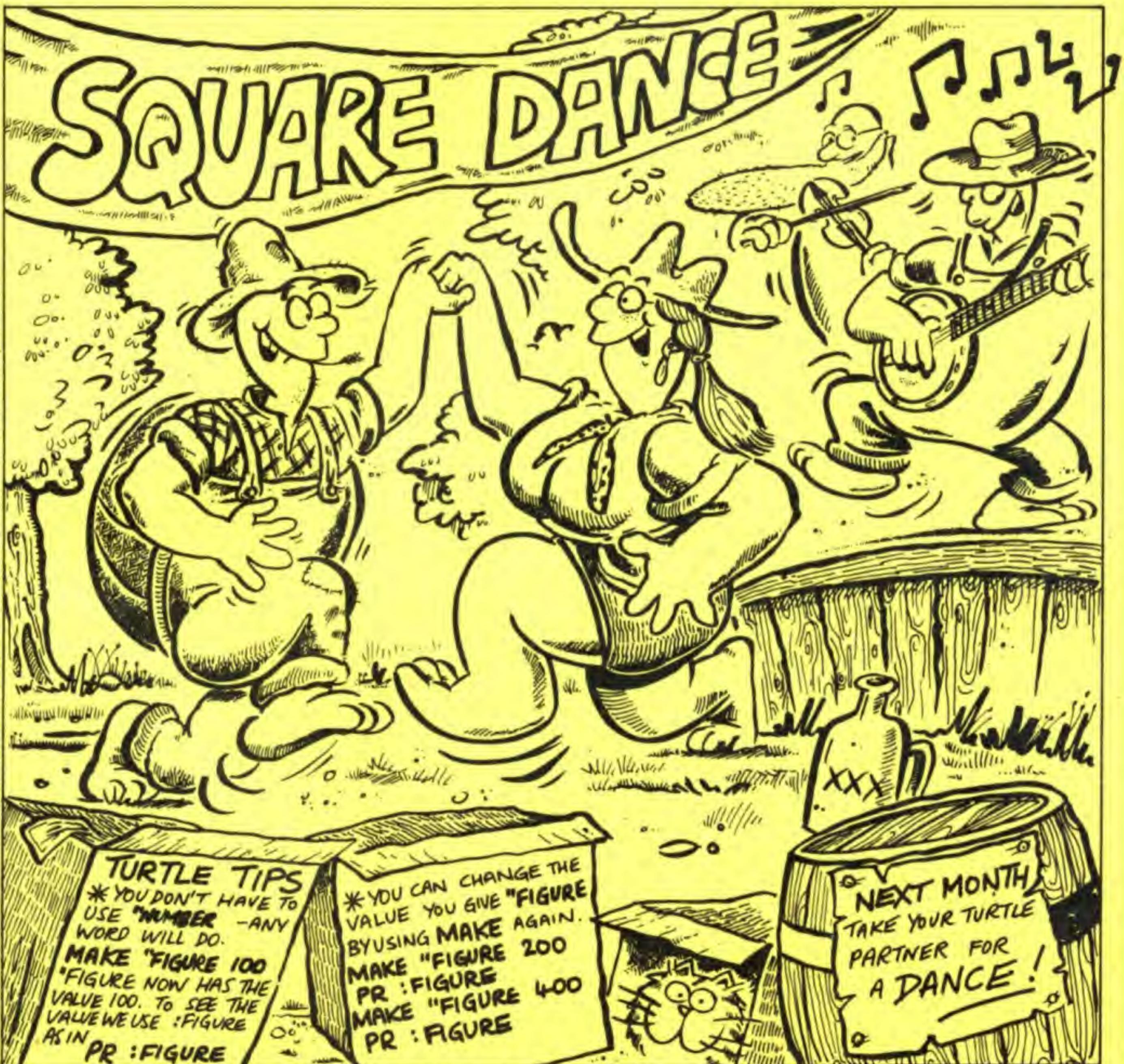
YES, THAT IS TO GIVE NUMBERS NAMES. WE USE:

MAKE "NUMBER 100

THE WORD "NUMBER" NOW HAS THE VALUE 100. SO WE CAN DO SUMS WITH :NUMBER

MAKE "NUMBER 100
PR :NUMBER
PR :NUMBER + 100
PR :NUMBER - 100
PR :NUMBER * 100
PR :NUMBER / 100

HEY, NUMBERS DON'T NEED QUOTES



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It's

OU

HOW A COMPUTER WORKS

Part 4

Last month we looked into the CPU - the brain of your computer.

But what use is a brain if it cannot pass messages to the outside world? So your computer needs a way of getting information out.

To do this it uses output devices. And there are lots of them. The most common ones are TV screens and printers.

But there are lots of others.

Robots, Midi interfaces and speech units are all output devices. Like the rest of your computer, they are all worked by numbers.

It's those zeros and ones we've seen before that make them work.

Look at a letter on your screen. Or a letter printed on a dot matrix printer.

You can clearly see that each letter is made up from dots. On the screen it may be out of a square that measures eight dots across and eight down.

Imagine each row of dots in the letter being controlled by a memory location in your computer. There are many thousand of these in every computer.

Suppose the top row of dots in a letter is joined to a location where the number 16 has been stored. That's 00010000 in binary.

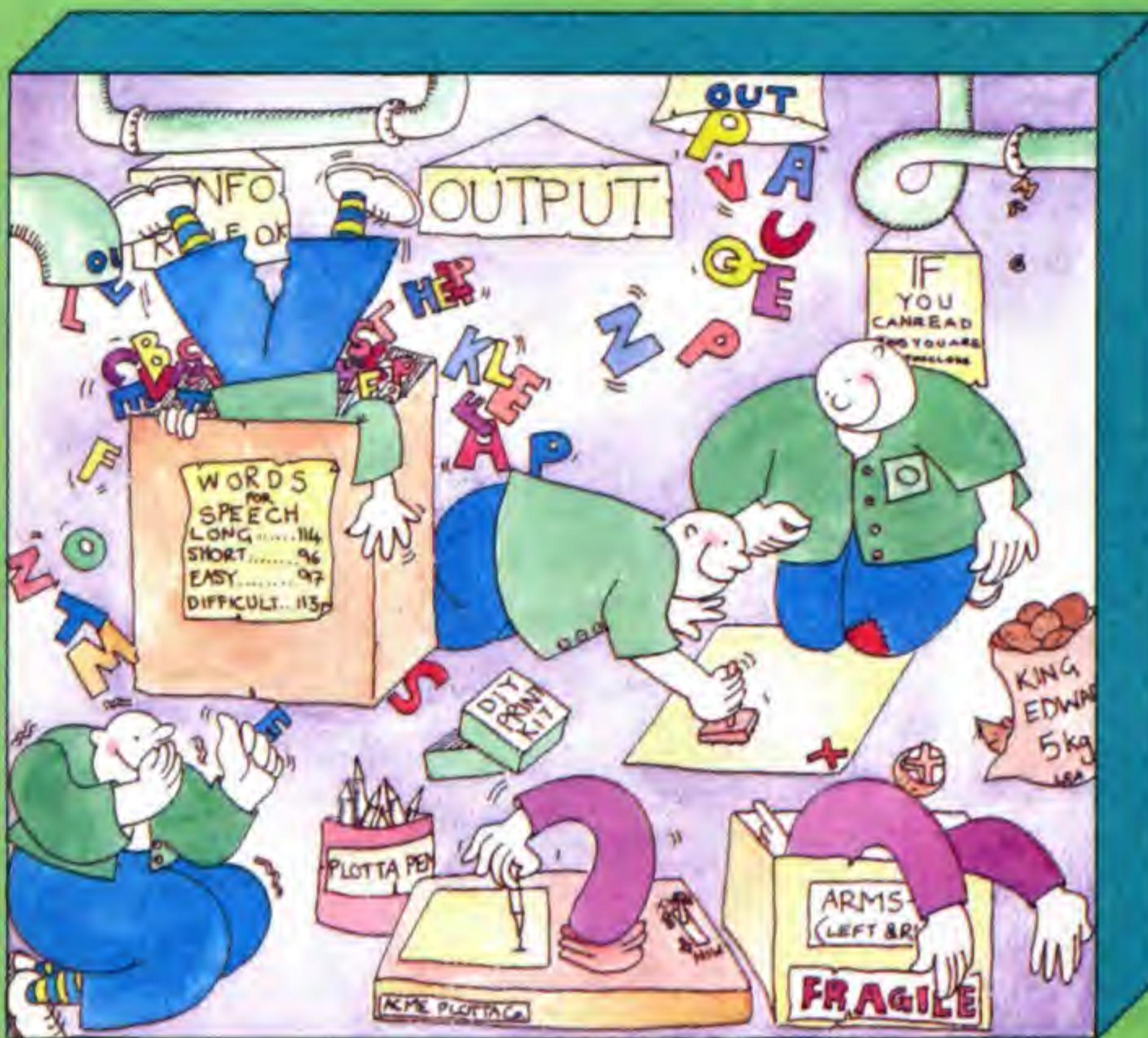
When that's sent to the screen a dot lights up. It's near the middle of the top row of a letter so it could be the point of the letter A.

Most printers work the same way. Even this page of Let's Compute! is made up of

NEXT MONTH: We look

OUTPUT

time



dots. But there are so many that you can't make them out without a magnifying glass.

Some output devices don't work by letting you see things. For instance, a computer can control a musical instrument. The instrument is then the output device.

But, if a computer works with numbers, how can it control a musical instrument? Let's think about how loud the instrument sounds.

Like everything else, the volume is controlled by numbers.

Some computers have only eight possible volumes. If a sound was produced going from quietest to loudest you'd hear the

eight steps. But if the computer has lots of steps - say 1024 - you won't notice them.

It's like when you have a lot of dots making up a letter on paper. It appears smooth.

Other features of the instrument can be controlled in the same way. By numbers.

There are also output devices that store information. They keep it in a form ready to be fed back in to your computer. Examples are disc drives and tape recorders.

These are called storage devices. They can input and output information to and from your computer.

• We'll look at them next month.

at how a computer STORES all those facts and figures

BINARY BITS

We asked last month if you could think how to write 16 in binary. The answer is 10000.

That's 1 Sixteen + 0 Eights + 0 Fours + 0 Twos + 0 Units. Now you've got sixteens you can count to 31. Try it.

And then all you have to do is bring in Thirty-twos. Next come the sixty-fours and so it carries on: 128, 256, 512, 1024.

We also said that it's easier to add in binary than in decimal. Why?

To add any numbers in decimal you need to know 100 facts. That's $0+0=0$, $5+7=12$, $7+5=12$, $4+2=7$ and so on.

They may look easy now, but when you started adding you had 100 different ones to learn.

But learning to count in binary would have been much easier. You'd only have had four things to learn:

$$\begin{array}{l} 0+0=0 \\ 0+1=1 \\ 1+0=1 \\ 1+1=10 \end{array}$$

And you do sums in a very similar way to decimal. The only difference is that you carry if the answer is bigger than one.

So, because a computer works in binary, it only has to be able to do a few simple things to be able to work out any sum you give it.



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And

PRIZE WINNERS

WIN A COMMODORE AMIGA

Wow! We never thought so many words could be made from the letters of Commodore Amiga. There were hundreds of entries - many with over 750 words.

With 1,121 words the winner is 12 year old Andrew Hatch from Waterloo in Lancashire.

Congratulations to him and everyone else who tried so hard.

SPOT THE DIFFERENCE

We had hundreds of entries to Mike Goldberg's challenge in October. But only five people spotted all 19 differences between the pictures.

The first correct one pulled from the pile was from Caroline MacDonald (8), Fort William. She will receive the superb hand-painted jigsaw made by Mike.

The other four correct entries were from Paul Clement (12), Donegana; Michael Heading (13), Belfast; Mark Argent (14), St. Albans and Nicola Rae (10), BFPO. They will each receive a small hand-made gift from Mike's collection.

This month's contests are on Page 9, 28 and 37

BONANZA CONTEST WINNERS

The Bonanza Competition in the October issue of Let's Compute had us fighting our way through the entries. However, here are the first correct 185 entries pulled from the sack. If your name is below you'll shortly be receiving a goody from US Gold or Ocean:

Andrew Nelson (6), Tetbury
Kevin O'Neill (15), Bexley
Mark Davis (11), Helstead
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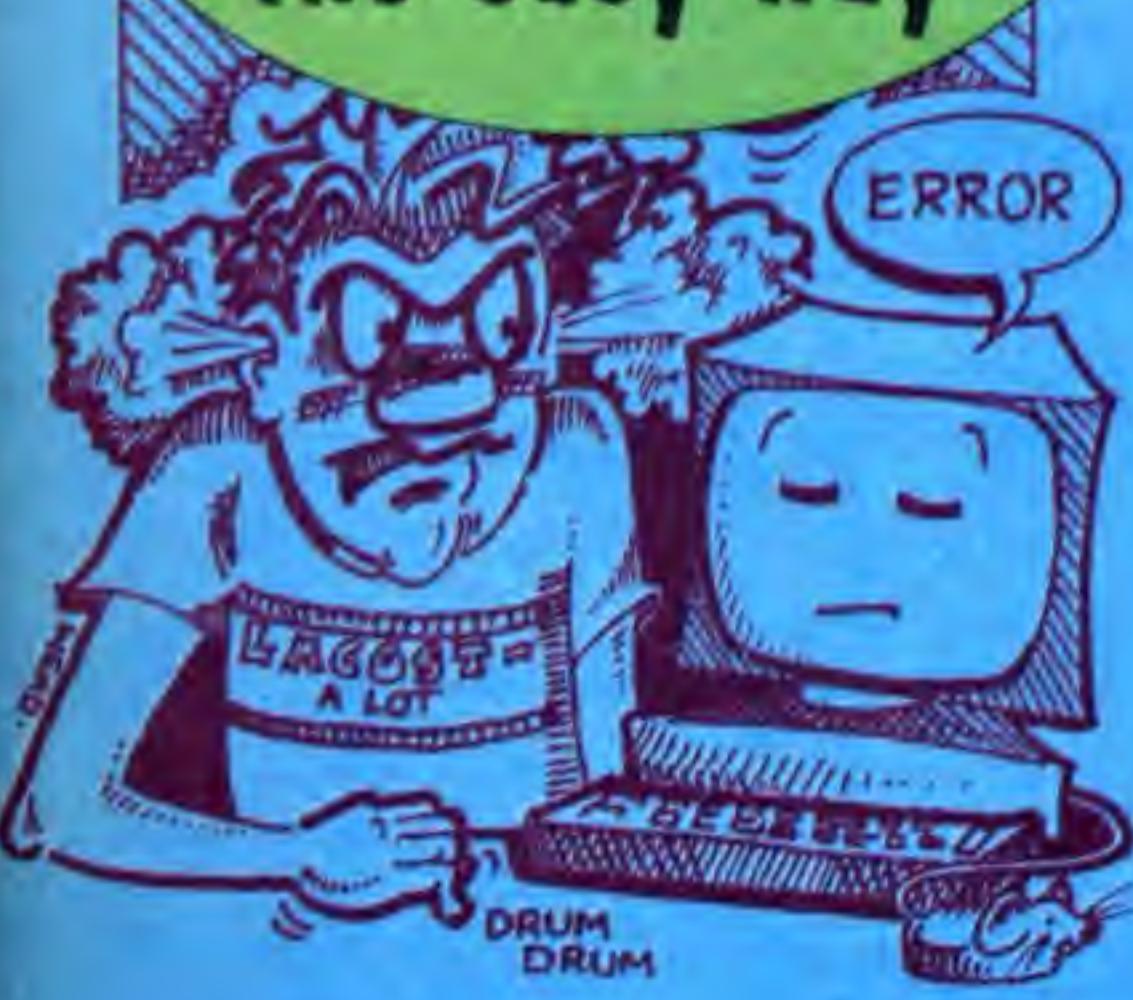
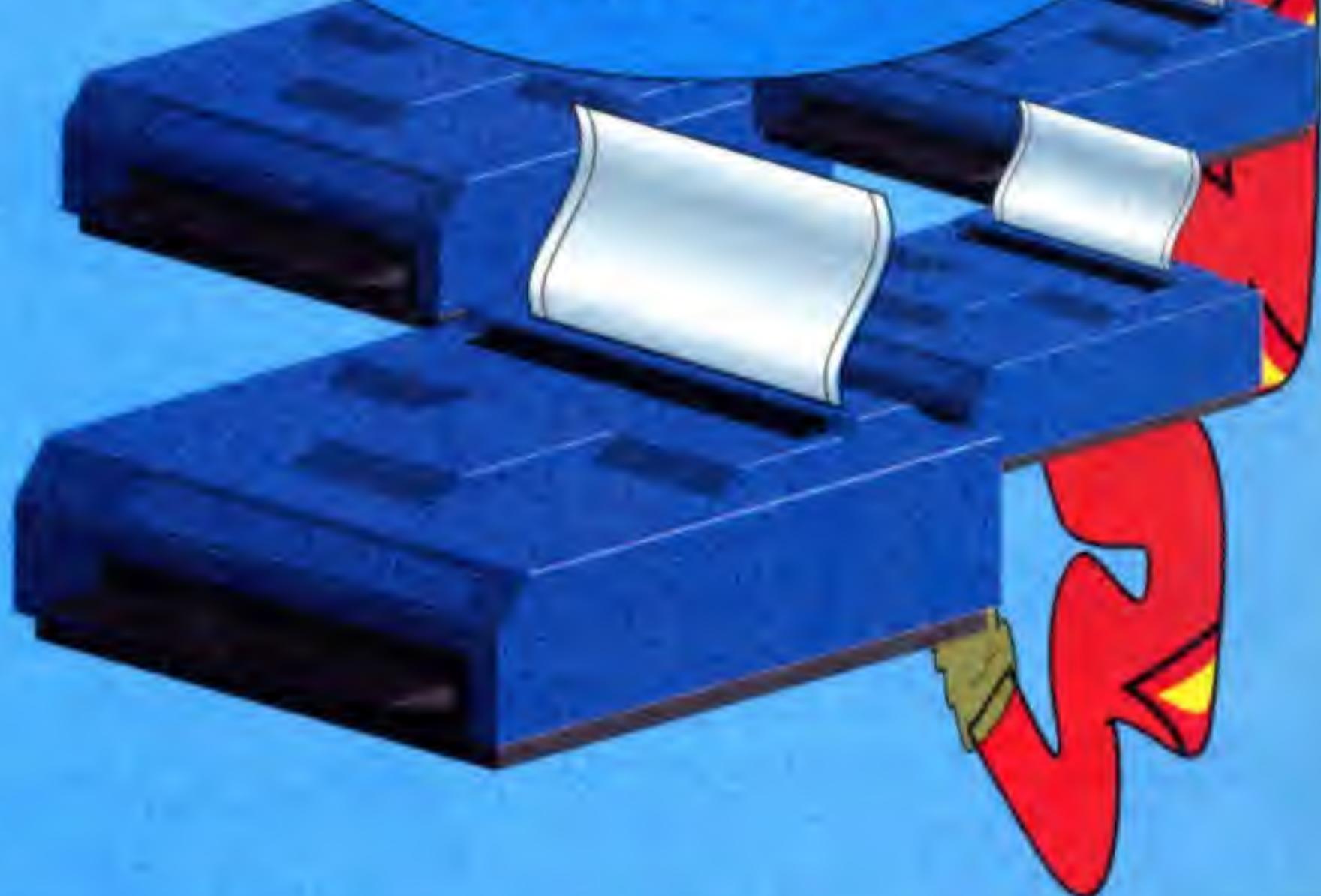
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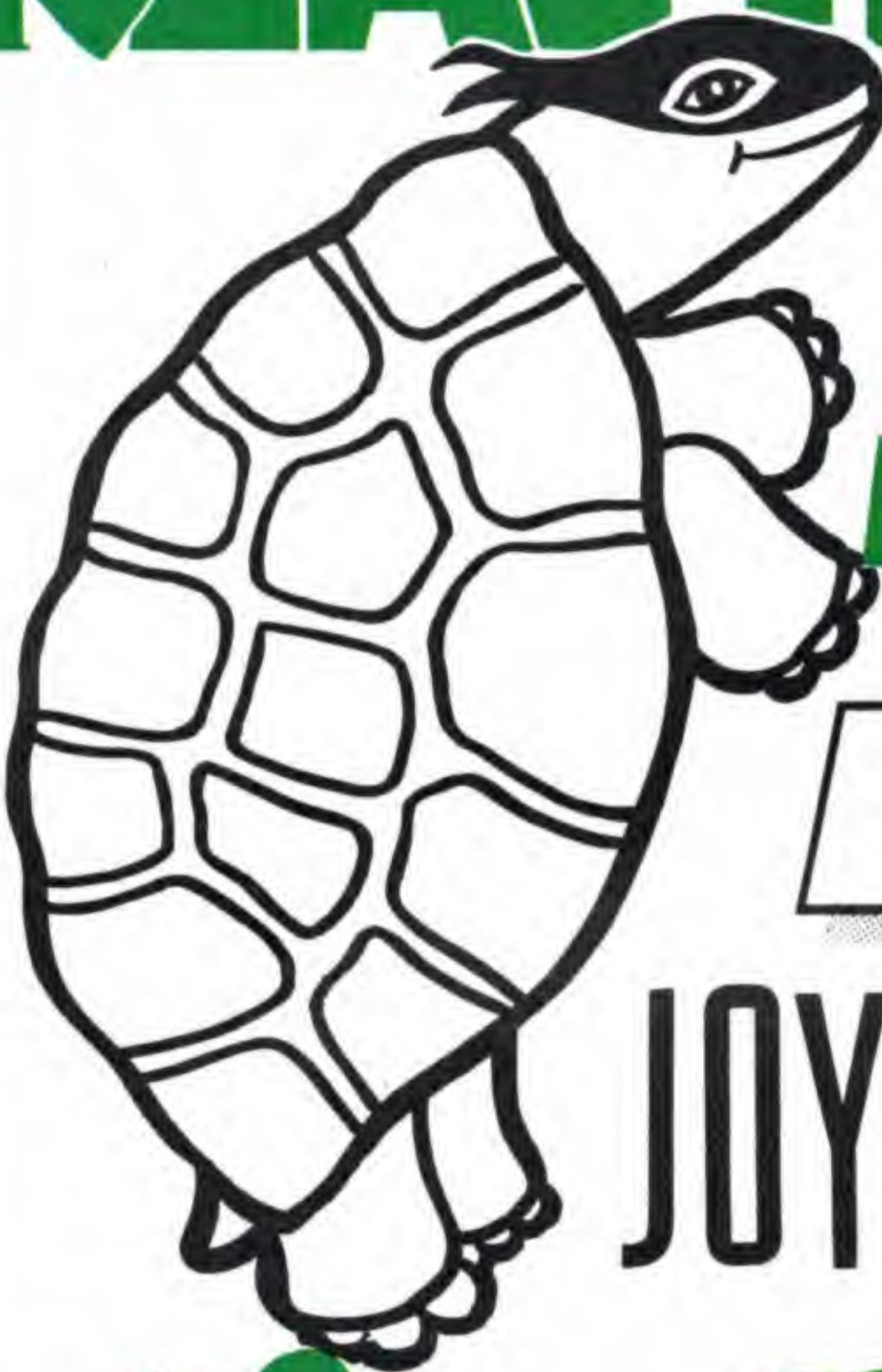
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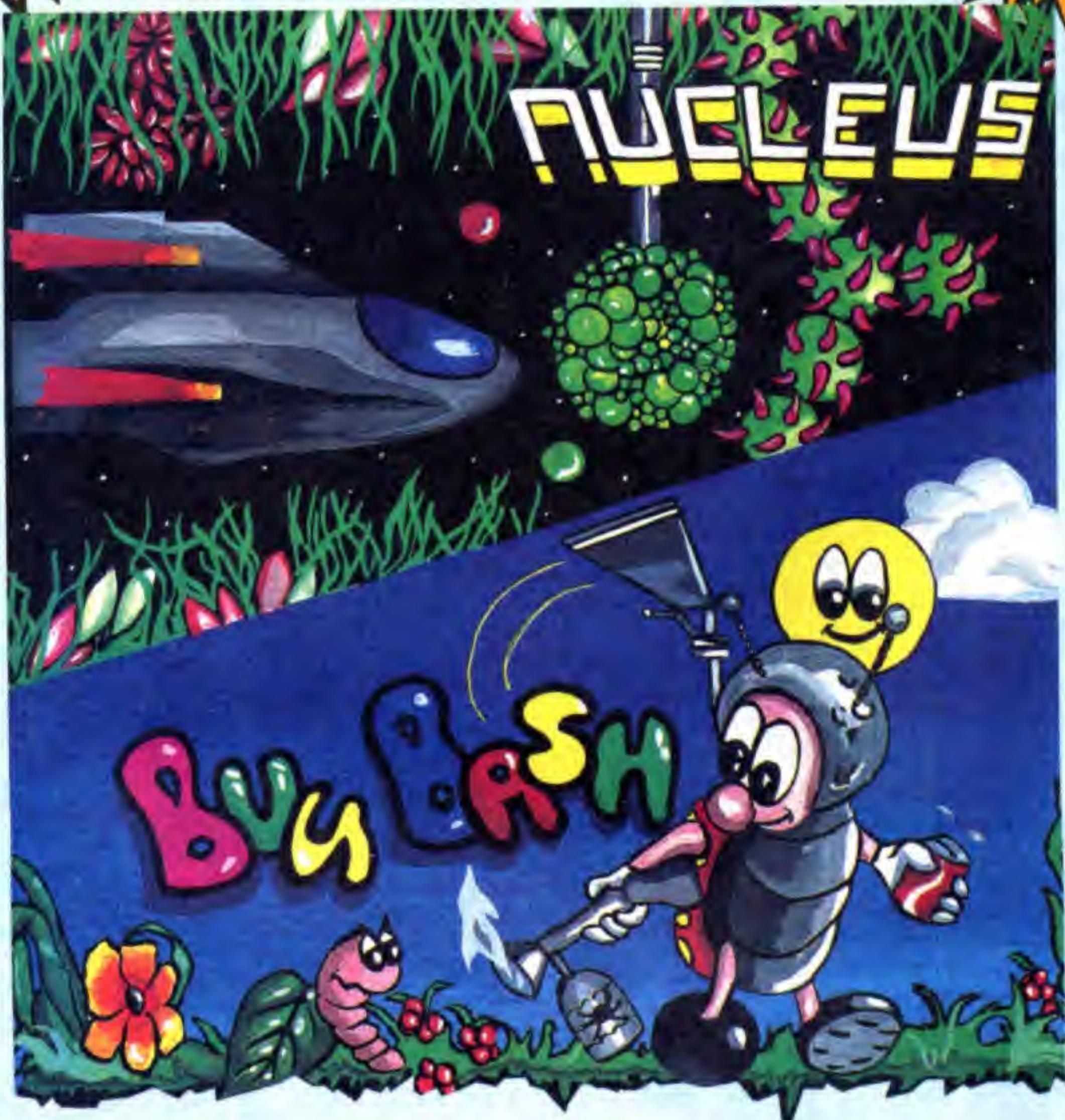
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